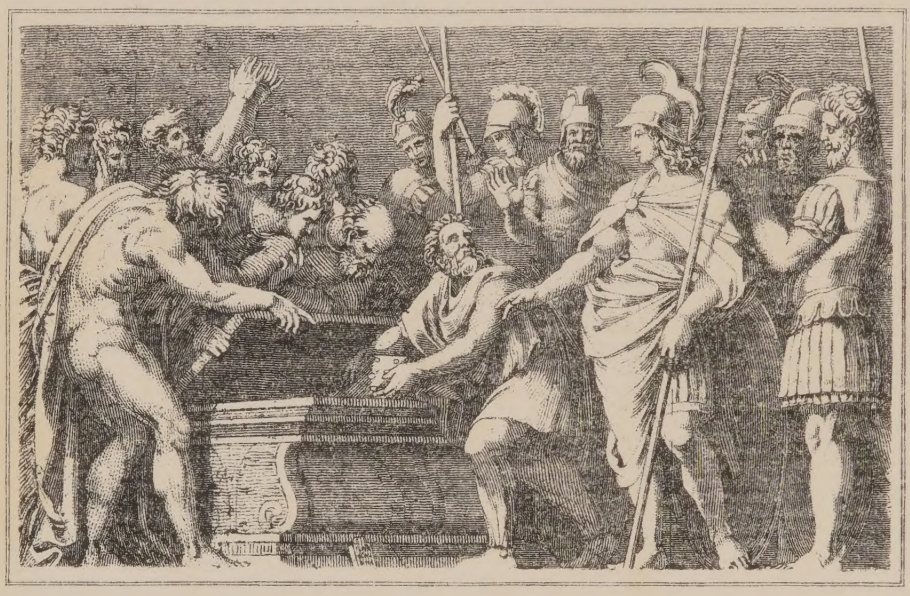

LIVERPOOL

MEDICAL AND SURGICAL REPORTS.

THE

LIVERPOOL

MEDICAL & SURGICAL REPORTS.

OCTOBER, MDCCCLXXI.

EDITED BY

P. M. BRAIDWOOD, M.D.,

AND

REGINALD HARRISON, F.R.C.S.,

ASSISTANT SURGEON TO THE ROYAL INFIRMARY.

VOL. V.

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1871.

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LIVERPOOL
MEDICAL AND SURGICAL REPORTS.

REMARKS ON UTERINE FIBROID TUMOURS AND POLYPI; THEIR PATHOLOGY AND REMOVAL.

By THOMAS SKINNER, M.D.,
PHYSICIAN TO THE LIVERPOOL LYING-IN-HOSPITAL AND LADIES' CHARITY.

In Obstetric surgery and practice, there are no operative measures which have undergone a greater change than those for the removal of uterine fibroid tumours; and let me add, that our text-books are still wofully deficient in conveying to the professional mind a sound and practical statement of the pathology of such growths—I mean such a vital and physical, such a truly surgical pathology, as will aid us in the necessary steps to remove them, and which ought to guide us when it is best to let them alone.

The following remarks are not so much the result of book-reading, as of actual observation and experience in the removal of fibrous tumours and polypi of the uterus; and, first of all, let me say something as to their pathology, especially as relates to their general management and removal.

I.—Pathology.

Most pathologists are agreed that these tumours have their origin in the fibro-muscular tissue, or the tissue proper, of the uterus, and that they are a *simple hypertrophy* of the fibrous

element.* The late Sir James Simpson held the opinion, and it is more than probably correct, that all fibroid tumours of the uterus, whatever their ultimate destination, have their origin in the substance of the parietes of the uterus—that all of them are, at one time of their existence, *intramural* fibroid tumours. As they grow, in like proportion does the uterine wall in which they are developed grow also; the same as occurs in pregnancy. In accordance with the situation of their origin, namely, whether it is the fundus, the body, or the cervix-uteri, and in accordance with their proximity to the peritoneal or to the mucous surfaces, so is their ultimate destination. If they originate in the fundus and nearer to the serous than the mucous surface, as a rule they are more commonly gregarious than solitary, and they emerge from the uterine fibrous tissue, pushing the peritoneal coat before them, until they form the tuberculated and irregularly lobate masses, so characteristic of large fibroid tumours of the fundus uteri; or, ultimately eneucleating themselves, they become pedunculated, and hang pendent from the uterus; or they even sometimes drop loose into the cavity of the abdomen. If they originate in the body of the organ, and the serous is the proximal surface, their course and destination is the same as I have already described. Of those originating in the fundus and body of the uterus, and whose proximal surface is the mucous or that of the uterine cavity, they are almost always solitary or single; and however sessile they may be in their attachment to the substance of the uterus, and however slow the process of eneucleation may be, still the destination or termination of all of them is to become intra-uterine fibroid polypi. Those originating in the cervix uteri I believe to be of less common occurrence than those in the fundus and body; but they are far from infrequent. They are almost always single, and tend like the others to become intra-uterine fibroid polypi. To all intents and purposes uterine fibroids are foreign bodies, and they

* The term *simple hypertrophy* is a dangerous one, and has, doubtless, largely conduced to the idea that fibroids, like other simple hypertrophies, are amenable to deobstruents, and can be absorbed. To all intents they are abnormal growths, false tissue, unlike any tissue surrounding them, as they are non-contractile and incapable of performing any useful, or any function whatever; besides, they are cystic, and the matrix is a false membrane, while in their nature they are essentially destructive.

act as such in the system. Like all foreign bodies, they follow the law which determines them to the nearest surfaces, whereby they may most easily and expeditiously obtain an exit from the body, or cease to disturb life and comfort.

All of the intra-mural tumours, especially those which tend towards the uterine cavity, have a loose fibro-areolar attachment to the substance of the organ; indeed, they are simply embedded, so to speak, in cellular tissue. Dissect off the mucous covering, and with a twist of the thumb and fingers, a cork-screw, or a pair of forceps, they may be dislodged, that is, by traction combined with torsion. This can be accomplished quite easily before the tumour has become pediculated, that is, when one half, third, or three quarters are intra-mural and the remainder intra-uterine, the essential point being, to divide the mucous membrane all round the tumour where it is reflected over the fibroid. The distal surface is best divided by the aid of Simpson's polyptome, the proximal by Grimsdale's intra-uterine scissors, or a scalpel. Torsion is then safe, as the mucous membrane cannot be torn from the healthy surface of the organ.

There is another and a most important point in the pathology of fibroid tumours and polypi of the uterus which must not be passed over, and that is, their growth, absorption and decay, in other words, their natural terminations.

I shall not attempt to discuss these disputed points, but I shall briefly state what my observation and experience have led me to believe. That they grow, no one doubts; and that they have periods of active growth and periods of rest, I am certain. I am equally certain that *the natural tendency to grow, to increase in bulk and density, never entirely leaves them as long as they have an attachment to the matrix which first conceived them, and while they themselves are possessed of life and capable of receiving nourishment from the system.* I have never come across a particle of evidence to lead me to the conclusion that so much as one grain of a fibroid tumour ever was absorbed by a natural process, that is, taken back again into the circulation. The proper substance of the womb, only after parturition, does undergo fatty degeneration, and subsequent disintegration and absorption, as also hypertrophy

of the natural substance from subinvolution. Inflammatory induration, or hypertrophy from exudation of lymph into or around the proper substance of the organ; effusions of serum and extravasations of blood, and such like enlargements, are constantly being absorbed; but the substance of a genuine fibroid—never! There is nothing more easy than to convince a patient of the possibility of this termination by absorption, as they are only too willing to believe anything favourable of their case, especially if supported by medical authority. And as to the patients' own feelings and ideas about their being either larger or smaller, it is simply so much leather and prunelle.

Almost all of those medical men who believe in the absorption of uterine fibroids found their observations, not on the natural terminations of the abnormal nutrition, not on the natural history of the complaint itself, but on certain results which they think they have obtained after the administration of certain deobstruent medicines, or medicines capable of removing enlargements of glands and other organs, hypertrophies of natural tissues, and inflammatory indurations and swellings. These agents act in a variety of ways, but invariably by stimulating a natural process—the processes of resolution, absorption, and the like. But, before uterine fibroids can be absorbed by a therapeutic agent, it would be well to know that Nature can and does effect such cures of them; it would be well to have proof that fatty degeneration, disintegration, atrophy and absorption are among the natural terminations of fibroid disease. *If absorption is not one of the natural terminations of the disease, then all the deobstruents on earth will not remove them.* The most flattering view which can be taken of the conclusions come to by the use of bromide of potassium and like agents is, that the *post* has been mistaken for the *propter hoc*. The successful cases reported are so ridiculously few, so doubtful as regards their real nature, and the result so questionable, it is remarkable that medical men, of known probity, of genius, and of high standing, *should make so great exceptions the rule of practice*. The natural process of eneucleation, already alluded to, is one of the terminations requiring to be enumerated. I will only add, in connection with it, that the condition of pregnancy considerably

affects eneucleation by hastening it, sometimes, however, at great risk to life from inflammation or hæmorrhage, or both, and by the risk of abortion, miscarriage or premature labour. In consequence, marriage, as a rule, is not advisable whilst a uterine-fibroid remains unremoved.

Uterine-fibroids are liable to undergo various forms of change in their elementary substance. By nature almost cartilaginous, they sometimes, at least in parts, become calcareous and even osseous. They sometimes contain small cysts or crypts or cells, with watery or colloid contents. If intra-mural or sessile, they are very liable to attacks of inflammation from trifling, probably constitutional, causes. Hence the danger of meddling with them unnecessarily, and the necessity, when removing them, of making *sure and quick work*. If intra-uterine and pediculated, the mucous covering is liable to ulcerate and to bleed freely, apparently from friction or from pressure when presenting at or through the os uteri. It has been and still is maintained by many, that these tumours undergo absorption and atrophy at the cessation of menstruation. I maintain that they do not. They often do become quieter; they cease to grow, and the concurrent hæmorrhage and leucorrhœa may cease or become less; but that the fibroid itself ever becomes less or absorbed I do not believe; on the contrary, I have oftener seen them increase rather than decrease in growth, at the change of life. Lastly, they may terminate in death by inflammation of their substance, as also of their areolar or mucous envelope; they then sphacelate and may be thrown off by suppuration or ulceration, according to their *locale*.

The most successful line of treatment, whether medical or surgical, will be that which is founded on the above natural history and terminations, wherein the processes of atrophy and absorption play no part whatever.

Before concluding this brief notice of the pathology of these tumours, I must allude to a very peculiar and common feature in their natural history, namely, the great tendency which they have to be accompanied by obstinate and excessive uterine hæmorrhage.

I was always taught to look upon uterine hæmorrhage, arising from whatever cause or condition, as something not only to be

avoided or prevented, but to be stopped. I have met with many old, wise, and excellent practitioners who still entertain, after a long life of practice, the notion that, in attempting to stop the usual hæmorrhage which accompanies the generality of fibroid tumours of the womb, they are acting *secundum artem*. With every deference, I beg to differ. Ask any patient who is the subject of a uterine fibroid, particularly of a large tumour, whether her general health is best when she is little poorly or when she is much so—when she loses little or no blood and when she loses much? Her answer will almost invariably be the same, namely, "When she loses much." Exceptional cases are doubtless to be found; but I have never come across an instance, where loss in some form or other of discharge, was not salutary rather than otherwise. As regards the chances of hæmorrhage after the removal of intra-uterine polypi, much has been said; and still more has it been foolishly dreaded. The past twenty or thirty years of practice have put those fears in the grave, and I trust that they will never again bedim our mental and surgical vision. In other words, there need not now be the slightest fear from the hastiest removal of a fibroid tumour, if in any way pediculated, and, to use a homely expression, *come-at-able*. The danger lies chiefly in delay, either before or during the operation of removal, or both. In laying down this rule of practice, I except all cases complicated with pregnancy, abortion, miscarriage or labour, and where inflammatory or other conditions are present, necessitating a special line of treatment, according to circumstances. This brings me naturally to the chief part of my subject:—

II.—The Surgery of their Removal.

First—As regards the *subperitoneal* variety. Some operators are sanguine and bold enough to attempt their removal. For my own part, I do not think the time has yet arrived when they can be considered as legitimate objects of surgical research or practice. I have not seen the case which I could recommend for operation; and I have never seen any case operated upon that did not terminate fatally. I have only seen two such, and I do not care to see any more.

Second—As regards the second variety—the primary condition of all varieties—the *Intramural.* I believe that, as a rule, the less they are meddled with the better. I am fully aware that various operations have not only been recommended, but actually put into execution by many eminent obstetric surgeons, such as gouging, the application of the potential and actual cautery, incising, and such like operative measures. I look upon the practice as rash, to say the least; and if the profession was put in full possession of the undoctored statistics, we would find that in nine cases out of ten, where the operation was at all indicated, the result has been death.

Third—As regards the third variety, *the Submucous, or Sessile,* those which are immediately beneath the mucous membrane of the uterine or cervical cavity, but which have a broad base of attachment to the uterine tissue, more may be said; as they are a more hopeful kind, though sufficiently treacherous to require their being approached with the greatest care, and apprehension as to the issue. There is only one method of removing such tumours, and that is by eneucleation—either by means of potassa fusa, or by incision and subsequent evulsion. The latter method is now, I believe, the only one ever practised. The late Sir James Simpson frequently practised it with considerable success, and Dr. Matthews Duncan, of Edinburgh, in one of the best and most practical monographs which he ever wrote, has given a very clear and succinct account of this class of cases, and the best way of dealing with them. The article I allude to will be found in the *Edinburgh Medical Journal,* for 1866–67. I only wish I could give as flattering an account of my experience as Dr. Duncan does of his. I have seen many cases such as he describes, but I have not dared to meddle with more than one of them in the way he advises; and, though terminating fatally, as the case is instructive, I now briefly record it.

Miss B., aged 28, the matron of a charity in this town, was the subject of a large fibroid tumour, $3\frac{1}{2}$ lbs. in weight, attached to the posterior wall of the uterus. From the profuse menorrhagia, which was occurring every three weeks or fortnight; from the utter impossibility of checking it, and from the fact that she

could not retain her situation as she was, I was consulted as to what had best be done. I took into my counsel my excellent colleague, Dr. Grimsdale, and we came to the conclusion that the tumour could only be removed by gradual eneucleation, as described by Dr. Duncan. In order to facilitate matters we incised the cervix uteri, and dilated slightly with the finger, leaving a plug of charpie *in situ*. Some days afterwards Dr. Grimsdale made an incision through the uterine lining membrane of the tumour, and we distinctly felt the smooth hard surface of the tumour through the lips of the wound, which was about three quarters of an inch to an inch long. The wound was plugged, but in spite of our best endeavours it closed again during an attack of acute metritis, following, in my estimation, upon some cervical injections intended to prevent septic poisoning. After a tedious convalescence, the patient was sent to New Brighton for change of air, and soon after her return we determined to make a fresh artificial opening in the site of the old one. I made a free and deep incision, about two and a half inches long by about an inch deep, upon the tumour, and both Dr. Grimsdale and myself were satisfied that we had done enough for the present. Although the patient did remarkably well for about a week or ten days, and although she took her food well and all signs of metritis kept away, *the wound completely cicatrised.* About this time a profuse serous hœmorrhage set in, which could not be stemmed, and the patient sank from exhaustion.

There were two things to be regretted, namely, the uterine injections which brought on the metritis, and the peculiar circumstances of the patient. On the whole, I am inclined to think favourably of this mode of treating the *Submucous* or *Sessile* variety of fibroid tumours of the uterus; and I should not deem my past want of success a sufficient reason for depriving patients of what must often be the only hope of cure they have from an intolerable malady, provided due care is taken in the selection of cases for operation.

As regards the fourth variety, the *intra-uterine fibroid* or *polypus* of which I give a few illustrations, there can be no doubt that they are the easiest to deal with, because they are *pediculated* and not sessile,—and they are almost always single. What I have

said before I now repeat,—most operators used to approach such tumours by operation in fear and trembling,—fear on account of the dangerous hœmorrhage likely to follow the sudden removal of them. If there is one point in their pathology more clearly proved than another, it is this—that the concurrent hœmorrhage which accompanies most such tumours does not come from the tumour alone, but from the entire uterine cavity, which is always enlarged or extended. It is also certain that the tumour simply acts as a cause of irritation for the determination of the hœmorrhage—it acts in short as a foreign body, wishing to get out. If so, what is the indication? Instant removal! Up to a very late date, however, the only method of removal was the ligature—a method which required for its completion from one to three weeks, according to the thickness of the pedicle. The *modus operandi* was by means of whip-cord and Gooch's double canula. The ligature having been successfully applied, it was then tightened as much as the strength of the cord would admit; and each day thereafter it was again tightened by means of a winch or otherwise, until the pedicle was divided, partly by strangulation and partly by ulceration. Besides the dangers from septic poisoning, irritative fever, and acute peritoneal or metritic inflammation, possible and probable on such a procedure, an actual experience of many years has now put it beyond doubt that the more immediate the removal of a pediculated fibroid, or fibrous, or any kind of pediculated tumour within the uterus, the better;—consequently, those who have had the largest experience in the removal of such tumours never resort to the ligature, but proceed *seriatim* to its removal. The modes of operating may be briefly stated as follows:—

1. *Preliminary Steps.*—In order to facilitate the removal, the first step to be taken, is to open up the passages for the introduction of the necessary instruments, and to obtain greater certainty as to the position, relations and attachment of the tumour and its pedicle. This, we are all aware, is best obtained by the introduction of sea tangle and sponge tents, and, if necessary, by incising the cervix uteri.*

* I beg to direct attention to a very useful instrument for introducing tents of *laminaria digitata*, an illustration of which, on a reduced scale, will be found on Plate 3, Figs. M

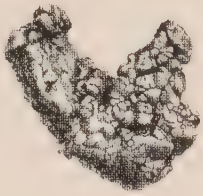
2. *Immediate Steps.*—As a rule, the fixing of the tumour by means of a volsella, or by means of Dr. McLintock's corkscrew, which, though common-place, is a most efficient instrument, and generally easy of application; transfixing with a cord, or placing a noose over it is next required. As regards volsellæ, there is no instrument in surgery worse made, simply because they are almost always made too sharp in the prongs. The prongs are generally made round, small and sharp—whereas, they ought to be square-shaped, tapering and sharp, combined with strength in all their bearings. As a rule, they are too long also between the joint and the prongs.* The small and sharp pronged volsellæ do not keep their grip; as soon as traction is made use of, they tear their way out; while the square-shaped ones keep their hold like bull dogs. The tumour, being firmly grasped, is pulled as low as it will admit of, and held there, whilst an ecraseur is passed over it, which may be accomplished in various ways. A noose may be made with the wire or chain and passed over the handles of the volsella, and ultimately over the tumour up to the pedicle, which latter may then and there be severed.† Sometimes, the pedicle is so thick and tough that the division is not so easy as *à priori* we might be disposed to imagine; as in the removal of the specimen (Plate 1. fig. C.) where the pedicle was two inches in diameter, and fibrous throughout. Such being the case, our next best step is to divide the pedicle immediately above the wire or chain of the ecraseur, with blunt-pointed curved scissors; or with a blunt-pointed curved bistoury, protected with lint where the cutting surface is not required; or, best of all, with the ingenious polyptome of the late Sir James Simpson, (Plate 3. figs. K and G.) The two tumours (Plate 1. figs. C and D) were

and H. It was made specially for me by Mr. Wood, of Church Street, in this town. It is on the principle of a porte aiguille, with an angle at the distal extremity corresponding to the axes of the uterine and vaginal canals.

* On Plates 3 and 4, will be found reduced representations of the most useful small and large volsellæ, in common use by the late Sir James Simpson. They have three prongs instead of the usual complement of two. The large sized volsella is straight, is ten inches long, is made in two halves, and locks the same as midwifery forceps. The small size is six and a half inches long, and is curved.

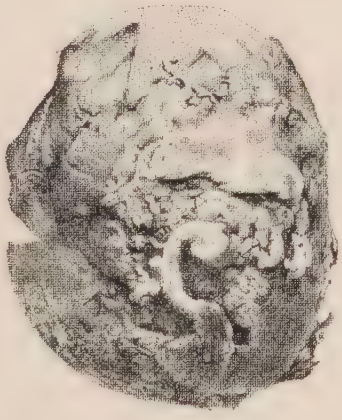
† Or, the wire or chain may be passed up looped or unlooped by means of metallic guides; but, as a rule, there is no instrument or guide equal to the fingers of both hands.

A



B

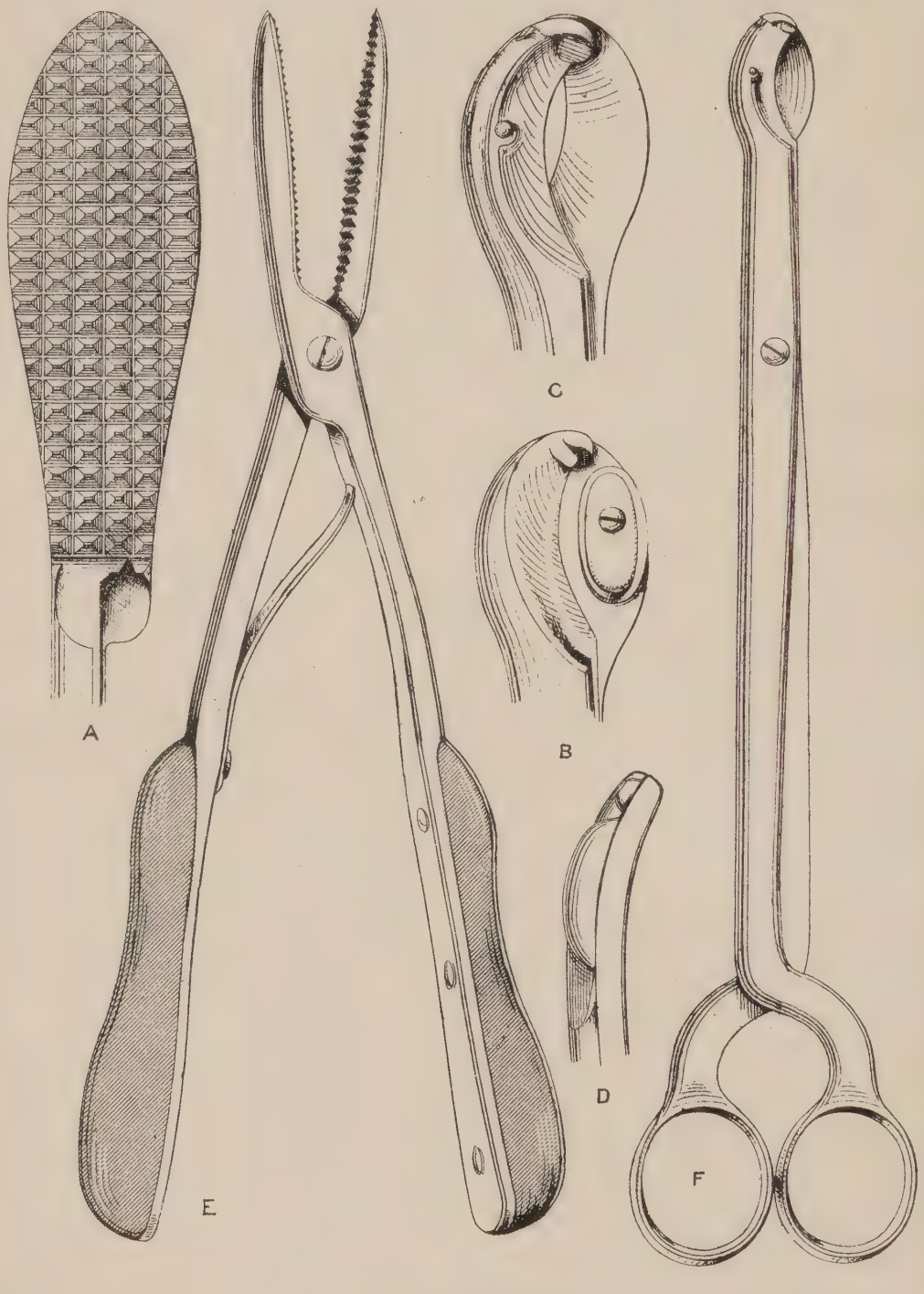
C



D

A. MacGregor, Lith.
Mathews, Macdonald & Margetts

DRAWN TO ONE-FOURTH SIZE OF ORIGINALS.



A. Macgregor (late
Mackenzie, Macdonald & Macgregor.

A. B. C. & D. FULL SIZE

E. & F. DRAWN TO QUARTER SIZE

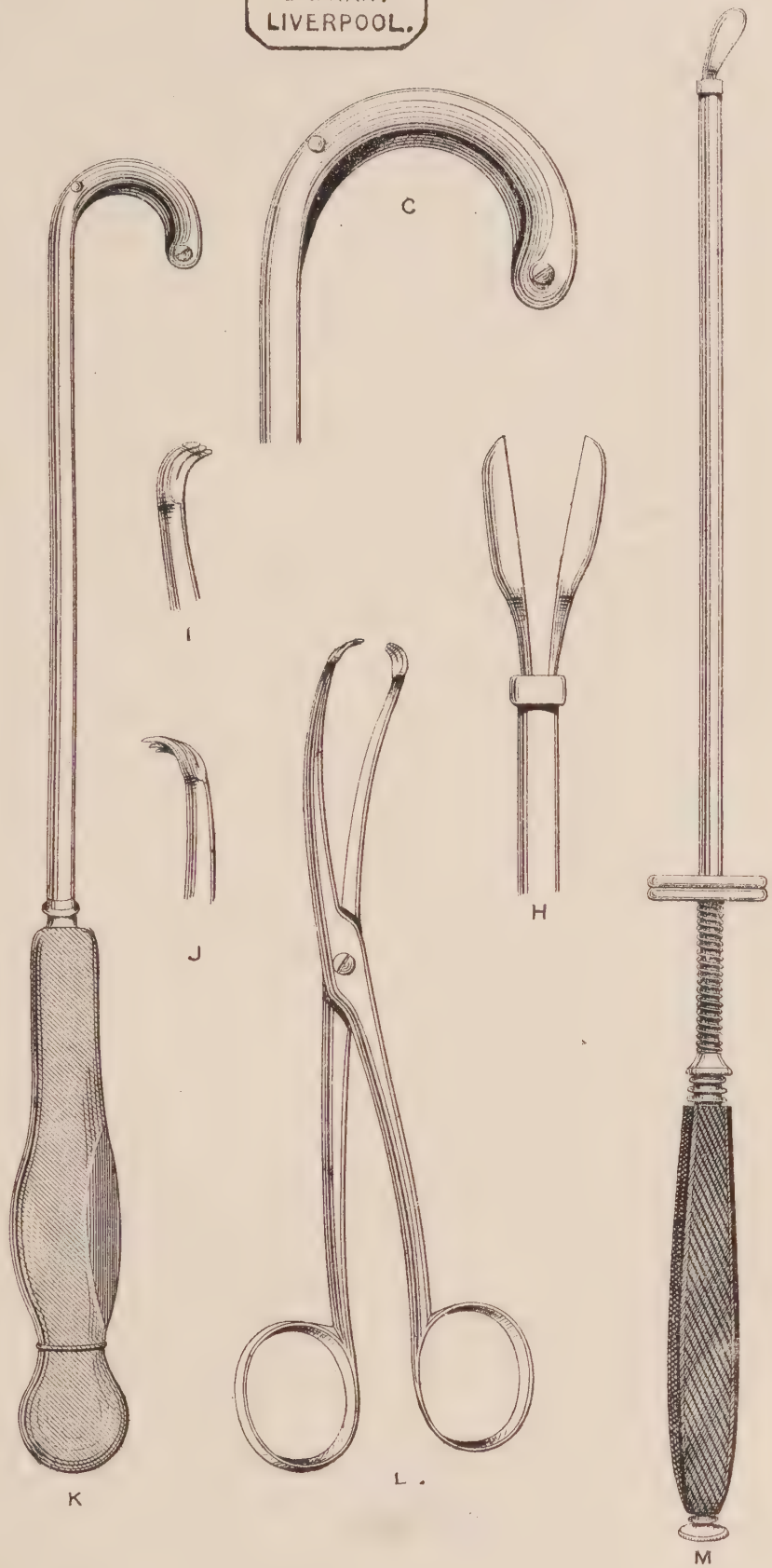
severed from their attachment to the uterus in a few seconds by means of this instrument—an instrument positively harmless to the surrounding parts.* The best form of intra-uterine scissors for the purpose (Plate 2. fig. F.) are the invention of my esteemed colleague, Dr. Grimsdale, of whose manipulative dexterity and surgical skill in the removal of such tumours it would be impossible to speak too highly.

Some of these pediculated tumours admit of being removed by traction with the fingers. I may instance one case of a patient of Dr. Swinden's, of Wavertree: a lady who had flooded more or less for three weeks after her confinement, and who was *in articulo mortis*, when I saw her with Dr. Swinden. A pediculated fibroid, the size of a pigeon's egg, was attached to the fundus uteri. By gradually dilating the parts, I got my hand in the vagina, and my fore and middle fingers into the uterus. By passing a finger on either side of the tumour, and finding that the pedicle was small and yielding, I pulled it off with a twisting motion. All hæmorrhage ceased; and the patient, from the last stage of anœmia, made a perfect recovery. In another case of a similar kind, which I lately saw with Dr. Swinden and Dr. Le Gros, of Wavertree, I removed a small fibrous or warty growth, along with a few mucous polypi, after the passage of sponge tents, by means of the nail of my right middle finger. In this instance the patient was quite as anœmic as the last. All hæmorrhage ceased with the removal of these trifling offenders. As an aid in the removal of such polypi, and of rugous and hæmorrhagic conditions of the lining membrane of the uterus, the uterine scrapers of Recamier, Simpson, and Locock are most useful.

There is still one other class of uterine tumours admitting of immediate removal, though not pediculated. They have no name other than fibroid polypi; they are really intra-mural tumours of the sessile or submucous variety, but they are small, almost always single, generally limited to the cervix-uteri, and not infrequent in their occurrence. They are generally of an ovoid, almond, or walnut shape, and one extremity generally projects into the cavity

* Whilst using the polyptome or any instrument for dividing the pedicle, the latter can scarcely be too much put upon the stretch.

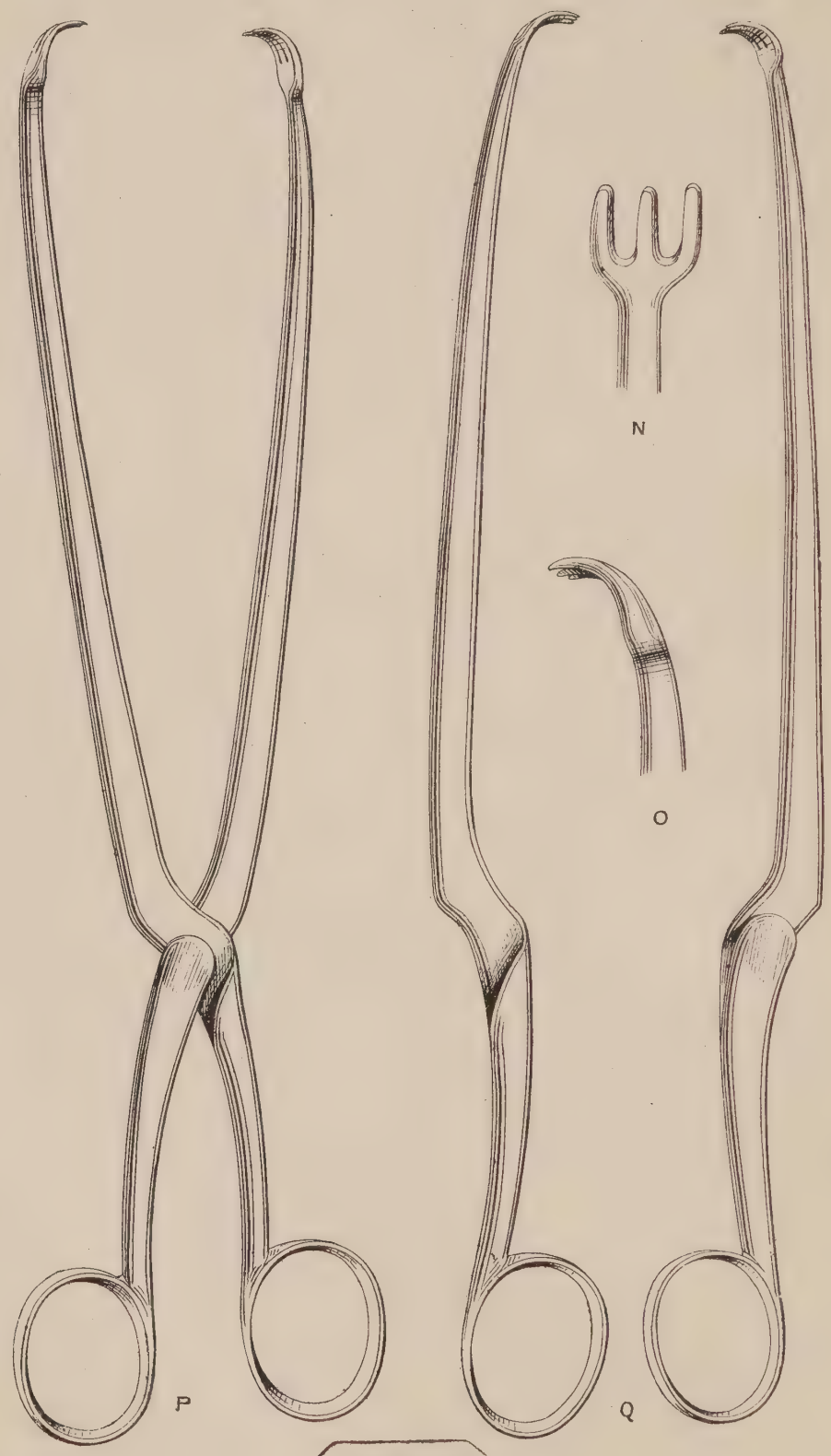
of the cervix or presents at the os uteri. I have seen several of this variety, and I have assisted the late Sir James Simpson in their removal. I have already alluded to them, and their mode of removal, in the first or pathological part of this article. I shall only repeat that, if *come-at-able*, they are perfectly safe to remove by Simpson's polyptome, and torsion, or by crushing with a pair of forceps I got made for that purpose, and for simplifying and shortening the operation of craniotomy. (See Plate 2, figs. E. and A.) It would appear that the life is easily *crushed out* of these growths; the curious part of it being, that, although they themselves are easily destroyed, it is sometimes very difficult to get at them to kill them, without endangering the life of the patient. This leads me to allude to another method of removing this growth; and I commence doing so by asking a question of myself. Is it wise to partially remove a fibroid polypus? Undoubtedly it is; and the more we can remove the less there will be, as a rule, of hæmorrhage thereafter. I remember a case, in which Dr. Grimsdale assisted me, at Waterloo. We broke two strong wires, and at last succeeded in passing a strong chain ecraseur over all that was *come-at-able*—about one-half of the substance of the tumour. We removed this mass; and the patient, who, for ten or twelve years before had flooded at each menstrual period, never more lost a drop of blood. Previous to the operation, a tumour of the size of a cricket ball was felt in the hypogastric region. On examination of the patient, about eight or nine months afterwards, there was no trace of any tumour whatever; nothing ever came away at all resembling a solid substance. This case was the first to lead me to the conclusion that it is sound practice, in severe hæmorrhagic cases, to remove as much of the tumour as is possible; and, if it cannot be cut with the polyptome or by the ecraseur, it may be crushed out of existence, or placed *hors de combat*, by the instrument represented in Plate 2, fig. E, or by a combination of crushing and cutting. As regards the justice and safety of this line of treatment, I know that it was practised by Sir James Simpson, by Mr. Baker Brown, in his gouging process, that it has been practised by McLintock, of Dublin, is patronised to a certain extent



A. Macgregor [late
Madras Medical Service.]

G. & H. FULL SIZE

I. J. K. L & M. DRAWN TO QUARTER SIZE



A. Macgregor (Late
Maclure, Macdonald & Macgregor.)

N. & O. FULL SIZE

P. & Q. DRAWN TO QUARTER SIZE

by Dr. Matthews Duncan, and that it has forced itself upon various practitioners, as recorded in our journals. One of the most instructive examples will be found in the *Transactions of the Obstetrical Society of London*, vol. x., where Dr. Hall Davis removed part of a large intra-uterine fibroid tumour, $6\frac{1}{2}$ ounces, then excised in pieces 3 ounces, and ultimately a mass, which was thrown off entire, weighing $8\frac{1}{2}$ ounces; in all, the tumour weighed 18 ounces. The lady made a perfect recovery. Such a case is very encouraging; but, as our American cousins would say, "the conservative drag after all is a valuable institution."

Regarding the tumour, Plate 1, fig. C, which weighed half-a-pound, I must say a word or two. The late owner of it consulted me on account of a draining menorrhagia three years ago. As the complaint resisted the usual and best remedial measures, I suspected organic mischief. On examination I detected a small intra-uterine polypus, about the size of fig. A, (same plate). I told the lady there was nothing for it but a surgical operation. I saw no more of her for three years, two of which she had spent under the care of a homœopathic physician in London, who told her that a surgical operation was quite unnecessary, and that he would cause the tumour to be *absorbed*. Of course she believed this, even although the monthly and fortnightly flooding went on the same. After being two years treated thus, circumstances forced her back to Liverpool, and she received advice, first from one and then from another homœopath, for another year, but all to no purpose. As the patient's life was ebbing, and all but *in articulo mortis*, she and her friends begged of me to take her case in hand. I took counsel with my friend Dr. Grimsdale, and we determined at once on removal of the tumour, which was executed in about twenty minutes, by means of Braxton Hicks' ecraseur, and Simpson's polyptome. From the time of the operation until now, nearly nine months, she has never lost one drop of blood, or ever "looked over her shoulder." The result of three years of homœopathic absorption by means of specifics was, that the tumour *grew* from about half-an-ounce to eight ounces.

The tumour, fig. B (one quarter the eal size), like a cauliflower,

is rare and peculiar, and is interesting, in that it was originally intra-uterine, was extruded from the os, giving rise to excessive pains resembling labour or miscarriage, and that its extrusion was accompanied by a very great show of blood. The patient was a companion to two old maiden ladies, and I was consulted, the character of the young lady being suspected. I found this tumour protruding from, and attached by a pedicle within the cervix. I detached it with curved scissors, and showed it to the ladies; upon which they both exclaimed, "*they were certain all along the girl was innocent!*"

The tumour, fig. D, plate 1, weighed four ounces, and was removed from a married woman aged sixty, being her "first born." The cervix-uteri had to be incised, and a stroke of Simpson's polyptome did the rest.

In conclusion, I shall enumerate the necessary *armamentaria* in the removal of fibroid tumours and polypi. The uterine sound or probe is most useful in diagnosis, and for measuring the probable size and even weight of the tumour. From the length of the cavity, one can frequently guess correctly the weight of the tumour. The wire ecraseur of Dr. Braxton Hicks, and a chain one also; Simpson's volsellœ, large and small, and his polyptome; Grimsdale's intra-uterine scissors; strong, blunt-pointed curved scissors, for incising the lips of the cervix-uteri, if necessary; a small uterine syringe, for hœmostatic injections; one or more uterine scrapers; my own polypus crusher, and a small and narrow pair of midwifery forceps, with sponge and laminaria tents, and their guides or introducers; wire and other ligaturing material; sponges, and an ordinary pocket case of instruments, may all be required in the removal of a single fibroid tumour or polypus, anywhere within the os uteri. In some few instances, additional instruments are required; those mentioned, however, will generally meet every requirement, especially where the operator is up to his work. I have not mentioned the vaginal speculum, because in tumours of the kind treated of, it is rarely of any use.

THE EFFECT OF IODIDE OF POTASSIUM ON THE ELIMINATION OF LIME SALTS.

By WILLIAM CARTER, M.B., B.Sc., LL.B., M.R.C.P.,
PHYSICIAN TO THE LIVERPOOL SOUTHERN HOSPITAL.

The marvellous rapidity with which organic deposits of a low grade disappear during the exhibition of iodide of potassium, is known to every medical man; huge nodes and secondary deposits of various kinds melting away almost beneath the eye. Many questions naturally arise with reference to the operation of a drug of this kind; such, for example, as "Does the influence which it exerts on those lowly deposits extend to the tissues generally? Does it dissolve and cause the elimination of the normal fibrous, osseous, and other structures to the same extent, and in the same manner, as it does the abnormal deposit, which enters into the formation of a node; or, if not, does it induce a rapid molecular change, and are the molecules, which it takes down from their places in the tissues, as instantly replaced by others? In other words, is there in the normal structures a rapid tissue *waste*, such as occurs when the iodide lays siege to a node; or merely a more than ordinarily rapid tissue *change*, destruction being followed by deposition so quickly as to prevent any diminution of substance? or is there neither?"

Questions such as these should be among the most elementary in therapeutics. Yet it must be confessed that the answers to them are as yet far from easy. Answers, indeed, are not unfrequently given, and that, too, in such a ready and off-hand way, as to lead the unwary to suspect that, respecting the particular drug concerning which the question is asked, nothing further can be learnt.

With reference to the drug, whose action forms the subject of this brief notice, want of time has prevented me from doing more,

up to the present, than investigate its effect on the elimination of one of the chemical products of the body, viz., the salts of lime. Does the exhibition of iodide of potassium lead to an increased loss of lime? Or, in other words, does it attack the osseous tissues in the same way and degree as it does the results of periosteal inflammation? For I suppose that the answer to one of these questions will, to most men's minds, be the answer to the other; and that, if it were capable of proof, that a largely increased quantity of lime was excreted during the administration of the drug, there would be no question as to the source of this increase being the bones. The questions proposed, therefore, were: Firstly—does the iodide cause an increased elimination of lime? And secondly—if it does, is this attended with waste, or is there merely a rapid tissue change—elimination and deposition keeping pace with each other? The answer which I obtained, and which was quite different from the one I expected, is contained in the account of the few analyses and experiments which follows.

James M'C., aged 28, a seaman, was admited into the Southern Hospital, under my care, on April 26th, 1871, suffering from syphilitic periostitis. He had very large nodes on the right arm and leg, the head, and elsewhere. For the two days immediately subsequent to his admission, he was kept entirely without medicine, and all his urine collected and examined, and the amount of lime contained in it accurately determined. For the three first days (it was towards the close of the third day that the medicine was commenced), the quantities voided were 50·45 fl. oz. (1440 cubic centimetres), with a specific gravity of 1015; 54 fl. oz.; and 41 fl. oz. He then began to take 5 grains of the iodide three times a day, when the quantity of urine passed was immediately increased to 64 oz. with a specific gravity of 1014; and for the next four days days 60, 40, 64, 64 fl. oz. were passed respectively, with specific gravities of 1015, 1019, 1017, and 1011. During the remainder of the treatment, while a larger dose, viz., 10 grains three times a day, was being taken, the quantity continued about the same, twice rising to 72 fluid ounces, with specific gravity of 1014 and 1016 respectively, and once, during an

attack of diarrhœa, sinking to 40 fluid ounces. The most obvious effect, therefore, of the medicine on the urine, was to increase its quantity from an average of 48 fluid ounces to that of 60 fluid ounces daily. Nothwithstanding this increase in quantity, its specific gravity was on the whole maintained, and sometimes increased, showing that the quantity of solids voided was not diminished under the employment of the iodide. All throughout, its reaction continued acid; and the employment of starch and nitric acid showed that the urine, after the first two days, always contained some iodide, the elimination of which must, of course, be taken into account when considering the high specific gravity. In no case was the actual amount quantitatively determined.

Four separate analyses were made; 200 cubic centimetres (about 7·05 fluid ounces) being taken on each occasion. The first analysis was of urine passed between the 27th and 28th of April, before any iodide had been taken. The entire quantity for the twenty-four hours, was 50·45 fluid ounces (1440 cubic centimetres), the specific gravity being 1015. The following was the method adopted. The urine being first evaporated to dryness, the residue was incinerated, so as to get rid of all organic matter. By boiling the ash with distilled water, the soluble salts were next removed. The insoluble residue was separated, dried, and boiled with nitric acid, filtered, and the filtrate treated with an excess of ammonia. The precipitated phosphates were redissolved by an excess of acetic acid, and the lime precipitated as an oxalate by means of oxalate of ammonium. Lastly, this precipitate, after being dried, was submitted to sufficient heat to convert it into a carbonate, and as such was weighed. In the 200 cubic centimetres, there was ·148 gramme of calcium carbonate (carbonate of lime, $Ca\,CO_3$), which, for the entire quantity of urine passed during the twenty-four hours, would give 1·065 gramme, or about 16·5 grains.

The second analysis was of urine voided between May 1st and May 2nd, while 5 grains of the iodide were being taken three times a day; and the two next, of that passed between the 8th and 9th, and 11th and 12th respectively, after the dose had been increased to 10 grains. The quantities of calcium carbonate on the three occasions were ·030, ·025, and ·070 of a gramme repectively,

which, for the entire quantities voided on the different days, would give ·275, ·23, and ·725 gramme, or about 4·25, 3·5 and 11·2 grains respectively. Quite contrary, therefore, to my anticipations, I found that the amount of lime eliminated during the exhibition of iodide of potassium, was considerably less than when no iodide was being taken. This seemed the more surprising because, from experiments made out of the body, the very reverse was expected. Thus, I submitted two small pieces of dried bone (portions of a human tibia), for five days, to the action of 50 cubic centimetres of distilled water, holding a decigramme (rather over $1\frac{1}{2}$ grain) of iodide of potassium in solution, and found, on separating the lime salts, that these were represented by ·118 gramme, or 1·8 grain of the carbonate. Whereas the same bone, submitted to the action of a similar quantity of water containing no iodide, for a similar time, yielded only ·042 gramme, or ·65 grain, a quantity which (when allowance is made for the small amount of ash necessarily present in the filter) is scarcely appreciable. From the result of this experiment, I certainly expected that an increased, instead of diminished quantity of lime, would appear in the urine while the iodide was being taken; and the fact that it was not so seems strongly to suggest a caution, not always borne in mind, viz., not to draw hasty conclusions concerning what is going on in the body from the results of chemical experiments performed out of it.

What the result of the exhibition of this drug is on the elimination of other constituents of the urine, such as urea, &c., I have not yet had time to determine, but hope to be able to do so on another occasion.

The analyses were in all cases made by myself, and for their accuracy I alone am answerable. The weighings were kindly performed for me by my friend, Dr. J. C. Brown, D.Sc.

ON SOME FORMS OF DISPLACEMENT OF THE UNIMPREGNATED UTERUS.

By J. WALLACE, M.D. Edin.,

ASSISTANT PHYSICIAN TO THE LYING-IN-HOSPITAL, AND LADIES' CHARITY, LIVERPOOL.

More than two thousand years ago, Aristotle formulated the statement, that "probably all art and all wisdom have often been already fully explored, and again quite forgotten;" and perhaps of no science or art is this more true than of that which is now termed Gynaecology. We are too apt to boast that this department of medicine has only begun to be thoroughly investigated and understood in our own time, and that all the grand improvements and discoveries which have been made in it belong exclusively to ourselves; forgetful of the fact that many of the most ingenious and valued of them were known and practised among the ancients. Herodotus,* for example, tells us that, amongst the Alexandrians, "each physician applies himself to one disease only, and not more;—all places abound in physicians,—some for the eyes, others for the head, others for the teeth, others for the parts about the belly, and others for internal diseases;" and Aetius, who compiled his book in the great library of Alexandria, speaks of the speculum, sponge tents, medicated pessaries, vaginal injections, caustic for ulcers of the cervix, dilatation of the constricted cervix, a sound† for replacing the uterus, etc. Further, in giving directions about the using of instruments, Aetius mentions the employment of vapour baths,

* Herodotus, book ii., c. 84.

† The late Sir James Simpson asserted that the sound, spoken of by Aetius and before him by Hippocrates and Avicenna the Arabian, was used only for dilatation, and not for exploration and measurement. In 1657, a probe, used as we now employ the uterine sound, and intended especially for uterine exploration, was described by Wierus and alluded to by Hilken, Cook, and others. In 1828, Samuel Lair read a paper before the Academy of Medicine in Paris, in which he counselled the use of the uterine sound.

medicated and simple, conducted by a reed into the uterus; while Colombat* states that the ancient Greek physicians made use of pessaries, like those just mentioned (air pessaries), of the form and length of the male organ, which is the reason they are called πριαπὶσχωτα, or priapiform pessaries; yet in our own day Gariel's air pessary has made his name famous over Europe. It is, however, during the last two hundred years, and especially during the last half century, by the united labours of Ambrose Paré, Récamier, Simpson, Bennet, Scanzoni, Marion Sims, and others, that the diseases of women,—and especially the subject which is treated of in this paper,—have been placed upon a standing of far greater exactitude, both as regards diagnosis and treatment.

Before considering the following forms of uterine displacement, let me refer shortly to the natural position of the uterus in the pelvic cavity. In the virgin state, the womb is two and a half to three inches in length, two in breadth at its upper part, and one in thickness; it weighs eight to twelve drachms, but after parturition from one to two ounces. It occupies the cavity of the pelvis between the rectum and the bladder; its fundus points upwards and forwards in the axis of the brim and a little below its level; while the cervix is attached to and projects into the upper end of the vagina on which it is supported. The folds of the peritoneum fall around it, forming the two anterior vesico-uterine, the two posterior recto-uterine, and the two lateral or broad ligaments; connected with these latter are the round ligaments which suspend and retain the viscus in its place. Between the two anterior duplicatures of the peritoneum, is the anterior or vesico-uterine cul-de-sac, and between the two posterior or folds of Douglas is the posterior recto-uterine cul-de-sac. When the fundus of the uterus ceases to form its superior portion and is carried forward into contact with the bladder, while its posterior surface points upwards, we have ante-version; and when at the same time the body of the uterus is bent at an angle with the cervix, we have ante-flexion. In like manner, when the womb is bent back into the posterior pouch or fold of Douglas, and the anterior surface is looking upwards we have retroversion, or

* *Diseases of Females*, Meig's Translation, p. 152.

retroflexion when somewhat bent on itself. These two forms of displacement are not always in the mesial line, for the organ may also have a flexion laterally to a greater or less extent. In addition, there may be elevatio, or procidentia uteri.

With these preliminary remarks, I pass on to consider the various theories of the etiology of uterine displacements, as based upon the pathological views of different authorities. Paulus Ægineta,* entitles his chapter on this subject—"Inflammation of the uterus and change of position;" and this, perhaps the oldest on record, is the theory adopted by Lisfranc and Récamier in the beginning of this century, and one which Dr. Henry Bennet, in his excellent work on *Inflammation of the Uterus*, has made so familiar to us in this country;—the metritis, it should be added, generally affecting the cervix only, and rarely the body of the uterus. The constitutional theory follows the inflammatory, but it does not stand the test of modern experience, although it exercises a salutary influence on modern practice. Dr. Tyler Smith looks upon leucorrhœa of the cervix as a morbidly augmented secretion from the mucous glands of the cervical canal, and as the primary cause of the secondary diseased conditions of the lower segment of the uterus. The next theory may be called the mechanical one, as advocated by Velpeau, Valleix, Simpson, Kewisch, Ditschy, and others. It is this, that dislocation is the cause of the inflammation, and not the consequence. The late Sir James Simpson modified that opinion considerably, as shown in his practice; and indeed, from the first, he always inculcated the necessity of first curing the inflammation, before mechanically replacing and retaining the uterus *in situ*.†

Next as to the separate forms of ante-version and retro-version, ante-flexion and retro-flexion,— for I shall look upon the latter as

* *Works—Sydenham's Society's Translation*, vol. 1., p. 620.

† Professor Alexander Simpson informs me he has no good reason for believing that the late Sir James Simpson's views in regard to retroversion of the uterus were ever greatly changed. Latterly he became more cautious in the use of the intra-uterine pessary, "but," says Dr. Alexander Simpson, "I never knew him express any sympathy with the opinions of those who regard inflammation as the cause of all uterine suffering." The interpretation therefore which Dr. Henry Bennet gives of Sir J. Simpson's opinions (*Vide Brit. Med. Jour.*, Oct. 1, 1870), must be considerably modified.

being merely intensified conditions of the former. Ante-version, according to the statistics of M. Nonat, is the most frequent form of uterine displacement met with; and this is testified to by Bennet, Scanzoni, Thomas, and many others. It is very frequently accompanied by a great degree of retroversion of the cervix. This arises, according to Bennet, in the same way as all other displacements of the uterus, from increased weight and volume of some part of the viscus, produced by inflammatory action,—as cervical metritis, and metritis affecting the anterior wall,—or by morbid growths, such as a fibroid tumour in the same situation. Marion Sims pointed out the latter remarkable condition as a cause of anteversion or retroversion of the uterus, and showed also that a small tumour attached to the posterior wall of the organ below the level of the os externum, whether pedunculated or not, will antevert it: and *vice versâ*, retroversion will be produced. Scanzoni considers that a relaxation and softening of the parenchymatous tissue of the uterus at the junction of its cervix and body are the predisposing causes of flexions; and he points out that premature marriage, taking place before the complete development of the organs, has much influence in producing flexions of the uterus.* I think this observation sufficiently elucidates the following case of anteflexion. M. Dujes asserts that flexions of the womb may be congenital, and may arise (as stated also by Marion Sims†) from short utero-sacral ligaments, or from inflammatory bands (as Virchow points out) uniting the uterus to the bladder or anterior cul-de-sac. M. Dujes also met with flexions in girls who had not yet attained the age of puberty. Cases of this kind are rare, yet I will by and by relate two such. Again, M. Dujes and Madame Boivin point out that the rapid development of the womb, which takes place about the twelfth year of the girl's age, may sufficiently explain how in some instances a more complete development of one wall of the organ may lead to a sort of organic incurvation.‡ Meigs maintains, and so does Colombat, that, anteversion being

* *Diseases of Females*, Gardner's Trans., 4th ed., p. 107.

† *Clinical Notes on Uterine Surgery*, p. 237.

‡ Dr. Barnes and others have recently expressed similar views as to the congenital nature of many forms of uterine displacements. (*Brit. Med. Journal*, Aug., 1871.)

merely an exaggeration of the natural inclination of the womb, varying with the conditions of the bladder and superincumbent viscera, no inconvenience may arise, unless a relaxed state of the broad ligaments permits the organ to fall on the bladder whenever the woman stands. Great fatigue, violent shocks, the repeated effects of a painful labour, vomiting, or constipation may be mentioned as causes of anteflexion.

The history of the following case of anteflexion after marriage, I will narrate from the patient's statement :—

E. S., aged about twenty years, was married in October, 1866. She had enjoyed good health previously. In December of the same year, being slightly ill, she consulted a doctor who thought she might be pregnant. At Christmas she received news which caused most violent mental emotion, and a few days later, monthly sickness came on with severe pain and vomiting; the discharge was excessive. Had no advice at this time. She was ill almost every three weeks after this date, and suffered terribly at each period from pains in the womb, nausea, and cold shiverings; was confined to bed each time for three or four days, and suffered continually from headache. About May, 1867, she again received medical advice, and was told that there was a false membrane forming in the womb, and that the great weakness was the result of pain and loss of blood. She was ordered tonic treatment, and medicine to check the excessive discharge at the monthly periods. She got gradually worse, and was unable to walk even a few hundred yards without suffering from headache, feebleness of the limbs, bearing-down pains in the womb, and the most distressing weakness, so that she feared her reason would fail.

In July, 1868, she consulted Dr. ——, who said the system was quite undone; that there was falling of the womb, with a degree of inflammation at the monthly periods. Under tonic treatment the general health improved, but the painful symptoms in the womb increased.

In June, 1869, she again consulted Dr. ——, who thought her general health somewhat improved, and, as he considered the womb was slightly distorted, he gave her a small instrument to support it with.

In August of the same year, whilst bathing, she received a severe shock by throwing herself from a height into shallow water, and striking violently on the rocky bottom. This accident merely aggravated her symptoms.

In October, 1869, she came to me for advice, and I found her suffering from anteflexion.

In March, 1870, I operated with the most favourable results, all pain completely disappearing.

Such is the lady's statement of her own case.

On February 23rd, 1870, I saw her suffering from profound prostration, consequent upon uterine colic, arising during menstruation. She had no sooner begun to recover the strength lost during the previous menstrual period, than another supervened with all its suffering and exhaustion, leaving her in a worse condition than before. Examination confirmed the opinion I had given in October, 1869. The case was one of well marked anteflexion; and it was with great difficulty that the uterine sound was passed, even after bending it to the proper angle. Indeed, so acute was the flexion, that I hardly think the sound would have passed if I had not tilted up the fundus uteri. The uterus was mobile, and the case was not complicated by any morbid condition. Having therefore got my patient into a suitable condition so far as the bodily functions were concerned, and as soon as the state of the general health would permit, I determined to operate. On March 1st, 1870, having administered chloroform, with the assistance of my friend Dr. Johnstone, and after again assuring ourselves of the nature of the lesion, and that there was no complications arising from ulcerations of the vagina or cervix, or from any inflammatory or morbid condition of the canal of the cervix, I replaced the uterus first with the sound; and, while Dr. J. pressed deeply over the pubes with one hand and with the other held the speculum, I dragged the cervix a little downwards and forwards by means of a volsella fixed in its anterior lip, and performed Marion Sims' posterior section of the cervix by means of Simpson's hysterotome, and completed it with the bent knife. The considerable hæmorrhage which followed was easily controlled by the perchloride of iron and glycerine. She did well until the third

day, when I ventured to separate the edges of the section with the sound; this was followed by profuse hæmorrhage and metritis of a subacute character, which yielded to large doses of opium, fomentations, and poultices. It was not until March 24th that I ventured again to examine the section, when I found it had been so thoroughly done that very little union had taken place, and that little I undid. The anteflexion had been completely cured. By way of comment on the above, I would specially point out the danger of metritis and peritonitis, as a consequence of separating the edges of the section on the third day; for more than once have I seen alarming symptoms follow such manipulations. On this account I am content to wait until the fifth or sixth day, and even then I only use the finger, and defer passing the sound until a later period. Let me also direct attention to the operation itself, as I do not think it has received that trial in this country which it deserves. Its performance is simple enough; the whole object in view is to rectify the mal-position and to make the bent canal a straight one, and so obviate obstruction to the menstrual flow, at the same time favouring conception. For an explanation of the mechanism of the reduction of anteflexion by posterior section of the cervix, I must refer the reader to the last edition of Marion Sims' work, and to Thomas "*On the Diseases of Women.*"

In the case I have just narrated there were no marked symptoms of disturbance of the functions of the bladder or rectum; but such does not always obtain. It is also well known that pressure upon the fundus of the vesical organ is better tolerated than upon the neck; and hence, in anteversions of the uterus, vesical symptoms are not the rule. But when, along with ante-version of the organ, there is hypertrophy of the body or cervix, and especially of the cervix, with retro-version of that part,—the lower segment of the uterus pressing the rectum backwards into the hollow of the sacrum,—constipation, and sometimes grave symptoms follow. Many years ago I had a patient so afflicted.

In May, 1864, I was summoned to visit Mrs. G., who had been married for several years, but had had no children. I found her in a state of collapse from intense colic of the bowels,—for it was

not her menstrual period,—persistent vomiting, obstinate constipation, and slight tympanitis. Fomentations, turpentine stupes, and subcutaneous injections of morphia gave considerable relief; but the symptoms of obstructed bowel persisted, and increased, until stercoraceous vomiting set in. Rectal injections, in the hands of a nurse, having failed to act upon the bowels, I examined the rectum and discovered this remarkable condition. The finger abutted upon a tumour which seemed to block up the rectum like a ball valve, the posterior part of the tumour pressing closely upon the sacral wall. On passing another finger per vaginam, this so-called valve, or rectal plug, was dicovered to be an enlarged conical cervix uteri which pressed backwards and downwards, while an enlarged posterior vaginal cul-de-sac partially invaginated it into the rectum. The body of the uterus was anteverted upon the bladder. I drew forward the retroverted cervix uteri, passed a long tube well above the seat of obstruction, and administered a large enema, which afforded immediate relief. This patient was twice under my care subsequently, for similar attacks, and the same manœuvre gave relief. Some time previous to consulting me, she had been under the care of a medical man, on account of a similar attack, and on this occasion she was bled and blistered; but whether this doctor discovered the exact state of matters is not known, as he died shortly afterwards.

I proposed relieving this patient by operative measures, but this treatment she would not permit.

These two cases are not uncommon forms of anteversion and anteflexion occurring in married females who have never had children; but, according to the statistics of authors, anteversion and anteflexion are frequently met with in those who have had children. In the instances above cited there were no vesical symptoms whatever; neither was there any inflammatory lesion of the uterus or neighbouring organs. The following case differs from the last in this respect, that the condition of the rectum was not the consequence of the uterine displacement, but the cause of it.

In February, 1870, I was consulted by Mrs. B., aged 40, on account of disease of upwards of two years duration, about

which she had applied to several medical men, but without any benefit. When she came under my care her symptoms were a down-bearing feeling whenever she assumed the erect posture, frequent vesical tenesmus, great pain in the region of the anus which prevented her sitting or walking, unless with great agony, and the most intense anguish during and after defecation lasting sometimes for hours. Life had thus become a burden to her, and was spent between the two varieties of a change from the bed to the couch, and *vice versâ*. Digital examination detected an ulcer, occupying the left and posterior part of the anus; and, on placing the finger of the other hand over the ischio-rectal fossa towards the coccyx, an indurated and painful thickening of the tissues was felt. Under chloroform, I found at the upper margin of the ulcer a small opening, the orifice of a blind internal fistula, through which I passed a bent probe, which led down to the induration above mentioned. I accordingly cut down upon the probe, and brought it out; after which I completed the operation for fistula in ano in the usual way. The same incision divided the base of the ulcer, which was nearly one inch in length and half an inch in width. During the operation, in which I was assisted by Dr. Johnstone, I found the cervix uteri pressing down upon the anterior wall of the rectum; and this was confirmed by a vaginal examination. The uterus was engorged and anteverted; and the cervix, enlarged and ulcerated, bleeding on the slightest touch, was retroverted and prolapsed. The depth of the uterine cavity was three-and-a-half inches. The rectal disease having been cured, the appropriate treatment for the uterine condition was followed by rapid amelioration; and the patient is now in perfect health, although she still wears, occasionally, when taking extra exercise, or when subject to extra exertion, one of Coxeter's pessaries.

The next case which I shall pass on to consider had a different causation, and one which has a direct bearing upon the use of the obstetric binder—I mean anteversion following labour. After parturition, the uterus is in the most favourable condition for being displaced, because of its increased weight, and the relaxed condition of the ligaments and vagina. A light binder may then so

press the intestines upon the uterus, as either to antevert or retrovert it; and the more I consider this subject, the more am I inclined to think that the obstetric binder has a very great deal to do with uterine displacements in child-bearing women, and that its indiscriminate use must sooner or later become a question of doubtful practice, to be settled upon its merits and demerits.

In November, 1869, I attended Mrs. H. in her eleventh confinement. The labour progressed and terminated favourably, with this curious exception, that, as the placenta was being expelled, I detected it was not all there. I was, however, on the look-out for some abnormality; for, in all her previous labours, she had severe and prolonged post partum hæmorrhage, which generally came on one, two, or three weeks after labour. On passing my hand along the shred of membranes, I discovered a cotyledon of the placenta firmly attached to the uterus. I detached it; and, on examining the placenta, I then found it perfect. During the week following her confinement the patient had the usual lochial discharge, but as it was offensive, Condy's fluid was freely used. On the eighth day, after the action of an aperient, she was seized with bearing-down and great pain, when she passed a mass, which a medical man, who was called in in my absence, stated to be a piece of retained placenta. He prescribed a hæmostatic for the hæmorrhage, and two hours later I found my patient still bleeding and suffering from faintness, jactitation, rapid pulse, flushed countenance, and great excitement. The uterus was deep in the pelvis, completely anteverted, with the os uteri directed against the promontory of the sacrum, and the vagina, as a consequence, closed against all possible exit of uterine clots. I corrected the displacement, and emptied the organ of a large mass of fibrous clots, exactly similar to the vaginal mass pronounced by another practitioner to have been a piece of the after-birth.

Before considering the next division of my subject I shall narrate another case of anteversion, with elongation of the cervix uteri, which at first, on digital examination, presented the condition of retroflexion, from the existence of a tumour in the posterior cul-de-sac. In December, 1870, Mrs. D., who had been

married six years but was never pregnant, consulted me for leucorrhœa, of three years duration, which had resisted all local and constitutional treatment. Digital examination detected elongation of the cervix, and what felt like the fundus uteri in the usual site of well marked retroflexion; but there was no history of obstructed menstruation or pain, and the uterine sound was passed without difficulty in the usual position. The uterus was moveable and above the normal size, but this was accounted for by engorgement and granular erosion of the cervix. The tumour in the posterior cul-de-sac was moveable and painful on pressure, as determined both by vaginal and rectal digital examination, and was probably an ovary. It had not given rise to any symptoms, the patient not knowing of its existence; and she only complained of a sickening, painful sensation when it was pressed. I put her under treatment for the lesion of the cervix; but as she went to sea with her husband, I lost sight of her until February, 1871, when she again presented herself in my consulting-room. The tumour in the posterior cul-de-sac had disappeared; the leucorrhœa, favoured by an indolent sort of life on board ship in warm latitudes, had become intolerable; the bladder had begun to sympathise, as shown by occasional dysuria; menstruation was now attended with pain; and the uterus measured three-and-a-half inches, and was anteverted; while the elongated and diseased cervix was retroverted, and so pressed upon the rectum as to partially account for the habitual constipation which existed. After suitable preparatory treatment, on February 15th, my colleague, Dr. Baker, administered chloroform; and on exposing the cervix uteri, with Marion Sims' duck-bill speculum, the following morbid conditions presented themselves. At the vaginal reflexion of the mucous membrane, a red inflammatory appearance was found; and this became more and more intensified towards the os tincæ, increasing into granular erosion, while around the os were seen distinct excavated ulcerations having a honeycomb appearance. A white gelatinous mucus was flowing from the cervical canal. I first performed hysterotomy with Simpson's hysterotome, and then grasped the cervix with the polypus volsella, and dragged it down so as to enable me to put the curved scissors around it

sufficiently deep to excise from before backwards fully three-quarters of an inch. The cervix was cut through with difficulty, as its tissue was as hard and tough as if it had been fibro-cartilaginous. The perchloride of iron and glycerine controlled all hæmorrhage, while opium and rest, with judicious nutriment, and attention to cleanliness by means of the vaginal douche, &c., completed the recovery. On March 11th, I found the cervix nearly healed, and the patient's health rapidly improving. Shortly after, this patient left Liverpool for her home in Jersey, where she put herself under the care of Mr. Marett, who, in a letter dated June 12th, 1871, writes to me, "that the incision made has healed perfectly; her health has much improved; catamenia recur with regularity and without pain; the interval quite free from any discharge, except slightly after fatigue." The progress of the lesions in this case demonstrated clearly the different steps in the formation of anteversion; though, in all probability, as the cervix became more and more elongated, the anteversion would have given way to so called procidentia. We have here, therefore, confirmation of the views held by Dr. Henry Bennet. Possibly melting down the hypertrophy with potassa fusa, or some other powerful caustic repeatedly applied, might have succeeded in gaining a cure; but the method adopted went straight to the object in view, and had the double advantage of saving time, and giving a certain result. The other interesting feature in this instance, namely, its similarity to retroflexion, shows the diagnostic value of the uterine sound.

Leaving this case of anteversion and simulated retroflexion, I now pass on to the next division of my subject, namely, retroversion and retroflexion of the unimpregnated uterus. Both these lesions are degrees of the same displacement. Marion Sims gives a table of three hundred and forty-three cases of malposition of the uterus, of which one hundred and seventy-nine were retroversions, and one hundred and sixty-four anteversions. He also states, that while one-third of all sterile women have anteversion from some cause or other, another third suffer from retroversion; anteversions prevailing in natural sterility, and retroversions in acquired sterility, or in those who have previously borne children. I have

already entered, as far as the length of this paper will admit, upon the pathological conditions which cause retroversion, many of which are complicated, theoretical, and uncertain of diagnosis; but the causation of the following remarkable case was simply mechanical, unattended with any inflammatory symptoms whatever, and cured by purely mechanical means. It has, therefore, an important bearing upon the mechanical and inflammatory theories of the schools of Simpson and Bennet.

In May, 1869, A. R., aged 17, a healthy-looking girl, came under my care, and in June (my late partner, Dr. Bruce, having confirmed the diagnosis) she was put under treatment. In narrating the history of her ailment the patient stated that she had been quite well until about six years ago (at eleven years of age), when she sustained a sudden and intense shock by the explosion of the *Lotty Sleigh;* she was under treatment for a considerable time, without any benefit, at general and special Institutions.

In June, 1869 (when she came under my care), having convinced myself that the uterus was retroverted, and the cervix uteri pressing forwards upon the neck of the bladder, while this viscus was empty, contracted, and almost atrophied, I introduced, with some difficulty (on account of the narrowness of the vagina), a stem and ball pessary. This was kept in for a month, and at the end of that time the patient was able to retain a considerable quantity of urine. I then withdrew the stem and ball pessary, and introduced and adjusted Simpson's pessary for retroversion; but before doing so I added a zinc and copper washer slid over the stem and separated from the ball by a gutta-percha cushion, in order to give the instrument a galvanic as well as a mechanical action, thus hastening the development of the organ, and inducing menstruation. She wore the pessary about three months, and menstruated twice during that time. I next withdrew the instrument, on account of the vulvar irritation it seemed to have produced; and a month later I found the uterus in its proper position, and the bladder able to perform its function, except when the patient overslept herself at night. The bladder could as yet only hold a certain quantity of urine, and after that it began to run over.

On February 7th, 1871, she came to my consulting room, and reported herself quite well, and able to follow her employment. She is in excellent health, and the menstrual functions are regularly performed.

This case requires no comment. It was rare of its kind, for it is seldom that retroversion takes place so early as the age of eleven. Yet that such an accident does happen was well known to Duges, Madame Boivin, Colombat, Scanzoni, and others long ago. It is not a displacement likely to be often met with at such an early age, and I was therefore not a little surprised to meet with another instance in a girl about thirteen years old. In this case, retroversion was combined with lateroflexion, and therefore, strictly speaking, this should be called a case of retro-latero-flexion. The history of this girl's illness is long and extraordinary, but I will not detail it; suffice it to say, that in December, 1869, when in Edinburgh, she vomited blood. Every month this discharge, which was looked upon by her medical attendants as vicarious, returned. In the middle of March, 1870, she began to discharge blood from the mouth, nose and ears, and this continued for five weeks, and so debilitated her as to endanger life. As soon as she was able to travel, she was brought home to Liverpool, and on June 10th, 1870, I was consulted. I prescribed tonics, aperients, exercise without fatigue, and, during the hæmorrhagic attacks, perfect rest, and ice internally. Towards the end of the month, violent uterine colic set in, attended with an intolerable dragging sensation in the loins, and pain extending down the right thigh, causing her to limp when walking. The history of this weakness in the right leg was, that, having missed her foot, she fell down a stair in March; and she has had pain, and limped ever since. This fall was followed by the alarming attack in March, which determined her parents to bring her home. About the 20th July, though her health was excellent, she had a terrible attack, not of vicarious bleeding, but of intense uterine colic, intermittent in its nature, and lasting upwards of an hour; attended by coldness and lividity of the extremities, syncope, and loss of consciousness for upwards of an hour, with loss of sight for two hours after consciousness returned. This dangerous

attack determined me on making a local examination of the vagina, and if necessary of the uterus. Having administered chloroform, with one finger per rectum, and the other hand over the region of the uterus, after a careful and searching examination, I ascertained that the organ did not occupy its normal position. The hymen was dilatable, so that at first the little finger passed without any effort, and then the index finger. Digital examination, and the passage of the uterine sound, clearly showed that the uterus was displaced, backwards and to the right side, towards and perhaps a little in front of the right sacro-iliac synchondrosis. I replaced the womb, and turned it as far to the left as it had been to the right, and kept my patient lying on her left side for a week. Since then she has had no uterine colic, and the pain in the right leg and limping in walking, immediately disappeared, and have not since returned. This patient, however, has had several attacks of vicarious bleeding, and a very alarming one last month.*

This case requires no elucidation; but, considered in connection with the preceding, it will be seen how apt a sudden shock, or succussion of the abdominal muscles, is to displace the uterus into such a position that it is not able to recover itself. The result of treatment in these cases proves that a sudden mechanical displacement may be corrected by mechanical means only.

My next is a typical instance of retroflexion, and narrated because it affords another example of the results of the use of Simpson's pessary. Although the use of that instrument has been latterly decried and objected to, there are cases where no other instrument offers the most remote prospect of relief. I cannot but endorse the sentiment expressed by Malgaigne in the discussion at the Parisian Academy of Medicine, that "a treatment which Amussat, Velpeau, Simpson, Huguier, and Valleix had tried, cannot, should not, be considered as repugnant to common sense."

In April, 1869, Mrs. D., aged 26, and married, consulted me on account of painful menstruation, bearing-down pain, and

* She has menstruated since that date, and now enjoys robust health.

irritation of the bladder, rendering her life most miserable. She had received advice from others without benefit, no one having thought it necessary to examine the condition of the pelvic organs. The symptoms above mentioned had existed in great intensity during the last two years, that being the period of her married life; but she had occasionally suffered during the past six years. She cannot, however, give any history of the first cause of the ailments. Uterine examination revealed complete retroflexion of the organ. The sound had to be curved almost into a semicircle before it would enter the cavity, and reposition was only accomplished after considerable difficulty, the patient being placed on her elbows and knees. As there was no inflammation of the cervix, and the body of the uterus was mobile in all directions, I introduced Simpson's pessary, which the patient wore with great relief to her distressing symptoms, until the beginning of August, when I removed it. Her general health had by this time improved greatly, and she expressed gratitude for the comfort she now enjoyed. After this she went to the country, and I did not see her for two years. On April 6th, 1871, she again came to my consulting room, with a return of her old symptoms, but in a minor degree. She stated that on going to the country she remained well for upwards of three months, but on resuming marital life she found that her old troubles began gradually to return. This leads one to suspect some disproportion between the genital organs of the husband and wife, as pointed out by Scanzoni and Henry Bennet as a frequent cause of uterine displacement. At present this lady has just recovered from granular erosion of the cervix and its canal. The retroflexion is not so well marked as previously—the fundus uteri being now higher in the Douglas sac. I therefore replaced the uterus and introduced one of Simpson's stem and ball pessaries, which I retained in position by moulding the flexible ring pessary into the proper shape. The pubic and vaginal stem portion of Simpson's pessary for retroversion can thus be done without; a matter of great comfort and convenience. Retroversion, arising suddenly from an accident, may as suddenly disappear. In a case of this kind which I once attended I was about to replace the womb

by means of the sound, but before I did so menstruation came on, and all the distressing symptoms disappeared, and an examination after shewed that the womb had replaced itself. In this instance, the diagnosis was confirmed by my late colleague, Dr. Bruce. Having thus clearly shown that retroversion may arise solely from mechanical causes and can be cured by mechanical means, may even rectify itself spontaneously, I shall now narrate a case which is clearly confirmatory of the correctness of the views promulgated by Dr. Henry Bennet and others. The case was seen by Dr. Davidson, who recognized the displacement. Mrs. J., aged 30, had been married three years, and had been complaining during that period of pain on walking, affecting the region of the uterus, the back and hips, and rendering sexual congress painful and undesirable. This had existed from the date of marriage, and she had not been pregnant. Vaginal examination revealed retroversion and right lateroversion, or retro-latero-dextro-version; also an ulcerated condition of the cervical uterine canal, which bled on the least touch. This state did not, however, extend to the lips of the cervix, nor to the vagina. The uterus was of normal size and moveable. The treatment consisted of topical applications of acid nitrate of mercury, carbolic acid, &c., to the canal of the cervix and the uterine cavity, followed by emollient, soothing, and ultimately astringent injections, the patient living the while *absque marito*. She was under treatment for about six weeks, at the end of which time she reported herself quite well, with no uterine symptom whatever, no menstrual pain, no pain on coitus, and with the uterus itself healthy and in the normal position.

The lesion in this instance,—the *origo mali*, upon which the uterine displacement and the whole train of morbid symptoms depended,—was subacute metritis of the lower segment and cervix of the uterus, which having been cured, the consequences disappeared. But retroversion may also take place gradually from the formation of morbid growths in the uterine wall, without their giving any indication of their presence for many long years. In 1864 I was called to a case of this nature. The patient was fifty years of age, past the climacteric period, and, with the exception

of rheumatic attacks occasionally, she had, throughout life, enjoyed excellent health. She was suffering from retention of urine when I first saw her. The bladder was enormously distended, so I proceeded at once to pass the catheter; but after entering the urethra a little way the instrument stopped, and could not be inserted farther. I then passed the finger into the vagina, when it abutted at once upon a hard rounded mass, which further examination demonstrated to be a fibroid tumour in the posterior uterine wall; the uterus was retroverted and the cervix was pushed against the urethra. The pelvic cavity was filled. I pushed up the mass, and passed the catheter. By teaching the patient to do the same when she could not empty the bladder I saved her and myself a great deal of farther trouble. She told me afterwards that pushing up the womb always enabled her to pass water freely, without the use of the catheter.

Such cases are not unfrequent; for, in January last, I was called to see a precisely similar case, and under similar circumstances. Both these cases were suitable for enucleation; but I hardly considered myself justified in proposing this measure until symptoms became more urgent. Whenever, however, that period arrives, I shall, without hesitation, cut down upon the morbid growths and remove them, guided by my recent experience in a case of a large fibroid growth, which half filled the pelvic cavity and obstructed labour at full term, and which I enucleated before delivery with forceps, with a satisfactory issue.

The next and final division of my subject is prolapsus uteri and elevatio uteri; but, before proceeding to consider these affections, let me remark that, in connection with anteversion, retroversion, and lateroversion, there is another condition of the womb which may be accompanied by any one of these malpositions, the womb falling to whatever side the patient may incline to, and giving rise to most distressing symptoms; I mean subinvolution of the uterus. In such cases there is involution of the thickness of the uterine wall, but little or no diminution of the size of the cavity. I have only met two such instances. The first of these patients came to consult my late partner, Dr. Bruce. Broken in health and in spirits, this woman, the cavity of whose uterus measured eight-and-

a-half inches, had not the courage to persevere with the treatment I recommended; and the knowledge of the nature of her ailment seemed completely to overwhelm her, so that she returned home without deriving any benefit whatever. In her case, the symptoms were very different from those in the next one I met with. Twelve months previously I attended this patient in a primiparous confinement, which was very laborious, and completed with difficulty, as she is a small woman, and the child was large. I applied the obstetric binder most carefully, kept her in bed a week, and she seemed to make a good recovery; but in about twelve months later I was called to her, and found her in a state of intense hysterical excitement, as she had lost the power of walking. She had, in short, reflex paraplegia, from subinvolution of the uterus. The depth of the organ was nearly seven inches; and, on testing its mobility, I found that the uterus could be moved in all directions in the abdominal cavity, but it could not be felt through the abdominal wall, nor was there any abdominal enlargement. Vaginal injections, abdominal frictions with iodine, tonics with iron and ergot, and rest, resulted in complete cure, and she has now remained well for upwards of twelve months. Whether the lesion of the uterus *per se*, or its pressure upon other organs, gave rise to the paraplegia I am at a loss to determine.

Elevatio uteri, or morbid ascent of the womb, is almost invariably a consequence of fibroid tumours, ovarian dropsy, or some other morbid condition; but sometimes the womb is found elevated to an unusual height, as a natural conformation, or as the result of the atrophy of old age. I have seen one well-marked instance of elevation from a peculiar arrangement of fibroids; one occupying each iliac fossa and pelvic brim, and a pedunculated fibroid, extra-mural, attached to the fundus uteri. I could not properly reach the cervix so as to guide the passage of the uterine sound. Fortunately these cases rarely require treatment, as nothing can be done for them. In the opposite form of displacement, or prolapsus, we can do more; for it is one of the greatest evils that a woman can dread, and hardly any other displacement has had more ingenuity expended on it. The subject is a very wide one, and I will only glance cursorily at a few examples of it.

I have already stated that, after delivery, prolapsus is very apt to occur. A case of that nature occurred in my practice in January. It resulted from the lady having imprudently lifted a heavy girl into a chair. The womb came down suddenly, and was suspended between the thighs; but an intelligent nurse at once put the patient on a sofa, replaced the organ, and sent for me. The womb was *in situ*, and rest in bed, with astringent lotions, for a fortnight, prevented a recurrence of the accident.

Dr. Henry Bennet has pointed out that prolapsus, although most frequently occurring in women who have had large families, also frequently arises from chronic inflammatory engorgement of the cervix and lower segment of the uterus, with all its attendant symptoms of leucorrhœa and increased weight and size of the lower parts of the organ. Such cases are not uncommon, but I shall only relate the last one which came under my notice. Mrs. L., æt. 34, who had been four years married, but was never pregnant, consulted me on April 6, 1871, for the following symptoms, from which she had suffered for three years. She complained of pain in the back and limbs, of down-bearing after exertion, such as walking, with continuous leucorrhœa and severe menstrual pain. Two years ago, she consulted Dr. Bruce for the down-bearing, and he detected rectocele as the cause. This still exists, and is produced by the lowered and enlarged cervix uteri. The sound passed for $3\frac{1}{4}$ inches into the womb. The vaginal mucous membrane is congested and tender, and the os tincæ is swollen, glistening, red, and covered with granular erosions, while the canal of the cervix bleeds when touched. The treatment consisted of tonics, the application of nitrate of silver and nitrate of mercury, and of soothing, emollient, and astringent injections to the parts. This was followed with success, so that, by the 12th June, all inflammatory uterine symptoms were gone, but the menstrual pain still existed. On examining the os uteri carefully, I found it so contracted that I could not pass a No. 2 bougie. This condition, without doubt, resulted from the caustic applications to an elongated, hard, tapering cervix uteri. The bulk of the organ was now much less, and the uterus had resumed its normal position in the pelvis, while the vagina had

so improved in tone that no rectocele existed. On the following day I performed hysterotomy, whilst the patient was under chloroform. The hysterotome did its work with difficulty, so hard and cartilaginous was the elongated cervix. There was little hœmorrhage and the incisions healed favourably. On July 26th, she called to tell me she had menstruated—the first time for three years—entirely free from pain; and all uterine symptoms have now disappeared.

This case requires little remark, for, the inflammatory conditions described by Bennet having been removed, and the small tortuous canal of the cervix laid open, the uterus resumed its normal position, and performs its functions without giving pain.

The next case is one of a type more frequently met with, and I shall allude to it chiefly because it was one of the first instances of incipient procidentia that I successfully cured by injections of a strong solution of the perchloride of iron.

Mrs. G., aged 42, came under my care in the early part of 1870. She is the mother of eight children, and her labours have been natural, with the exception of three, where the children were large and the shoulders were extracted with difficulty. She had menstruated regularly, but had occasional menorrhagia, also uterine pain, pain in the back and limbs, and inability to walk, but without much of the bearing-down feeling, and without dysuria. On examination, I found granular erosion of the os tincæ and a truly ulcerated condition of the canal of the cervix. The engorged uterus had gravitated low in the pelvis, causing cystocele and rectocele, the vagina and the uterine ligaments being in an atonic and relaxed condition. The cervix was retroverted, and the fundus uteri lay over the bladder somewhat more than usual. The application of different caustics to the os tincæ, to the canal of the cervix and cavity of the uterus, relieved the engorgement and erosions sufficiently to enable the patient to tolerate a Coxeter's pessary occasionally when out walking. The use of it, with various astringent injections, gave her comparative comfort for a time, but the symptoms threatened recurrence whenever they were omitted.

I next prescribed a lotion, containing one part of the strong liq.

fer. perchlorid. to eight parts of water, and increased the strength of the injection cautiously to one in four. This had such a powerful constringent action on the vagina, that it was impossible to introduce the finger twenty-four hours after its use. She could now walk with comfort, without any sense of down-bearing, and consequently the pessary was laid aside. After the first application of the lotion in the strength last stated, a complete cast of the cervix and vagina came away. The injection was repeated, and such was the constringent action of the remedy on the relaxed vagina, that not only did the cystocele and rectocele rapidly disappear, and the uterus resume its normal position in the pelvis, but I believe it would have been possible by this means to close the vagina, if its application were too frequently and improperly repeated. This injection sometimes causes external vulvar smarting, but rarely any internal pain. This patient is now completely well, and has not found it necessary to use the lotion for many months.

I have had several other cases of a similar character and cured by similar means, but I shall only refer shortly to one instance of complete procidentia, in which the uterus protruded in the third degree, and in which there was no elongation of the neck from hypertrophy. The organ was engorged, but there was no erosion or ulcerative disease of the cervix. The application of the acid. nitrat. hydrarg. for a few times to the cavity of the uterus, was followed by the use of the liq. ferri perchlorid. fort. (one part to four of water) in the form of vaginal injection. This was repeated from time to time for three months, and the relaxed condition of the vagina rapidly diminished. But as this patient had to stand and walk much she was greatly improved by an appropriate adaptation of the flexible ring pessary. In the liq. ferri perchlorid. fort., we have an important addition to our vaginal applications; but I should hardly venture to speak definitely as to its seemingly specific value in certain forms of procidentia, until I have had further experience. For the important question arises: Do cases of long-standing procidentia ever recover spontaneously, as it were, or by the use of pessaries, meant merely to give mechanical support, and not applied with a curative intention?

Two-and-a-half years ago I was summoned to a case of syncope, from agonising pain in the hypogastrium, caused by complete procidentia. After the subsidence of the urgent symptoms I ordered a Gariel pessary. She got one of the largest size, and wore it and others for eighteen months. About six months ago, I was called to see this patient when suffering from bronchitis, and on enquiring if she still had the procidentia, she said no. She had been obliged to get a smaller and smaller instrument, and now she was able to do without one. As she was much strained by the cough, I recommended her to reintroduce the pessary and to wear it for a time.

My remarks hitherto have referred to cases in which no injury has been done to the uterine supports, to the vagina, or to the perinæum. When these parts have been injured or destroyed, elytrorraphy, as practised by Marion Sims, will generally succeed. Nearly two years ago I cured a cystocele and prolapsus uteri in the third degree, by the combined operations of elytrorraphy and perinæoraphy, after the manner described by Marion Sims in his works. In this case, the sphincters of both vagina and anus were torn through completely, so that all control over the bowel was lost.

TABLE FOR THE EXAMINATION OF URINE.

By DR. J. CAMPBELL BROWN,

LECTURER ON CHEMISTRY AND TOXICOLOGY AT THE LIVERPOOL ROYAL INFIRMARY SCHOOL OF MEDICINE.

I. Observe the colour and appearance of the Urine, whether it is clear or turbid, and whether it contains much mucus.

A high colour may be due to BILE, BLOOD or PURPURINE; a pale colour may indicate excess of WATER, and frequently also GLUCOSE.

II. Observe the reaction to red and blue litmus papers.

Normal urine is slightly acid; if the reaction is alkaline, and the red colour of the paper is restored on drying it, the alkalinity is probably due to ammonium carbonate from the decomposition of urea; confirm by observing whether effervescence occurs on the addition of an acid to the urine.

III. Observe the specific gravity.

(a.) If the specific gravity is above 1025, test for glucose by (1.) Potash solution and heat; GLUCOSE gives a dark solution. (2.) Add potash and filter, if necessary, then add copper tartrate and more potash until a blue solution is obtained; on heating to the boiling point GLUCOSE reduces a red or orange precipitate of Cu_2 O.*

(b.) If the specific gravity is high and sugar is not present, add to a portion of the clear urine in a deep watch-glass about one-half its volume of cold concentrated nitric acid; a deposit of hexagonal plates of urea nitrate

* In cases of diabetes it is generally desirable to estimate the total amount of sugar passed in twenty-four hours, before treatment, and again after some weeks' treatment of the patient. For the methods of estimating quantitatively the constituents of urine, refer to "Neubauer and Vogel, Analysis of Urine; Translated by Sydenham Society."

indicates excess of UREA. (Probably excess of phosphates and other salts will be found accompanying excess of urea).

(c.) If the specific gravity is below 1012, this may be due to great dilution of the secretion with WATER, which will be further indicated by the large quantity passed in twenty-four hours; but it is more generally due to disease of the secreting organs, and is accompanied by albumen, the urine being then frequently alkaline, but sometimes acid.

IV. Heat a portion to the boiling point in a test tube, albumen may be at once coagulated; add nitric acid drop by drop; a flocculent precipitate indicates ALBUMEN; confirm by adding to another portion of the urine acetic acid, filtering to remove mucus, if necessary, and then adding potassium ferrocyanide; a white precipitate indicates ALBUMEN. The deposit from an albuminous urine should be examined microscopically for CASTS, PUS and BLOOD GLOBULES.

Boiling alone may first cause a precipitate of CALCIUM PHOSPHATE, which will be re-dissolved on the addition of nitric acid. If a turbid urine is rendered clear by boiling, the turbidity is due to urates.

V. Add to a portion of the urine, ammonia in excess; the white precipitate consists of ALKALINE-EARTHY PHOSPHATES; filter and add ammonium chloride and magnesium sulphate; the white crystaline precipitate indicates the amount of phosphate which was originally present as ALKALINE PHOSPHATES.

VI. To another portion add ammonia and filter; then add ammonium oxalate; the white precipitate contains the CALCIUM as oxalate.

VII. To another portion add nitric acid; divide into two parts; to the first add barium chloride; the precipitate contains SULPHURIC ACID as barium sulphate. To the second add silver nitrate; the curdy precipitate contains the CHLORINE as silver chloride.

VIII. A dark brown or blue colour may be due to INDICAN which is destroyed by nitric acid.

Any colour from that of Gregory's powder to an olive green tint may be due in part to bile.

(1.) Pour a layer of the urine (concentrated, if necessary,) on to a white dish, and add concentrated nitric acid. A play of colours, green, blue, purple and red, indicates BILE PIGMENT.

(2.) Boil a portion of the urine with acetic acid, and filter to remove albumen, then add a few crystals of cane sugar, and a few drops of concentrated sulphuric acid; a purple tint indicates the ACIDS OF BILE.

A red colour may be due to blood; in this case heat will have destroyed the colour, and coagulated the albumen of BLOOD. Examine

(1) by the microscope for BLOOD GLOBULES, and

(2) by the spectroscope for HAEMATINE.

A high colour may also be due to purpurine. In this case it is unaltered by heat and by nitric acid. Boil a portion with hydrochloric acid. A dark red or purple colour indicates excess of PURPURINE, of which a small quantity is present in normal urine. Allow to stand for a day; the crystals which slowly form are URIC ACID, an excess of which frequently accompanies purpurine.

CASES OF POISONING RECENTLY TREATED AT THE LIVERPOOL ROYAL INFIRMARY.

By W. J. CLEAVER, M.B.,
HOUSE SURGEON.

Two Cases of Poisoning by Carbolic Acid.

Case I. J. J., a policeman, aged 38, was admitted on February 27th, having swallowed by mistake two or three mouthfuls of crude black carbolic acid, such as is used for purifying sewers.

He arrived at the Infirmary three-quarters of an hour after the accident, and was then in a state of complete collapse, with profuse perspiration, cold extremities, contracted pupils, stertorous breathing, and an intermittent pulse.

Galvanism and friction were resorted to, with injections of brandy per rectum, but they failed to rouse the patient; the stomach pump was tried, and although about two pints of warm water were thrown into the stomach, nothing could be got out; the reason for this was explained at the post-mortem examination.

At 5 p.m., the patient died, six hours after the first occurrence, shock to the nervous system evidently being the cause of death, as he never recovered from the collapse.

A post-mortem examination was refused, but wishing to see the effect of the acid on the stomach, I made an angular incision one inch from the spine on the left side over the last rib, and, through that opening, extracted the stomach and five inches of the æsophgus. The stomach was nearly full of a fluid resembling gruel, but a little darker, with a strong odour of carbolic acid, in which were numerous pieces of mucous membrane, in fact, the lining membrane of the stomach was almost completely burned or peeled off, the small portion that remained adhering to the walls was arranged in a linear form, and could be detached with almost the slightest touch; the membrane did not present a charred and grey

appearance, as it does when acted on by other corrosive poisons, as sulphuric acid, but was white and bleached; the œsophagus presented the appearance of leather, tough and unyielding; and the canal was very constricted, the cardiac orifice was so narrowed that it would with difficulty admit a small sized pea, which plainly showed the reason of the failure of the stomach pump. I could have wished the post-mortem examination had been more extensive, so that the intestines, spleen, trachea and other organs might have been examined.

Case II. G. B., aged 40, was admitted on March 21st, having attempted to commit suicide by swallowing about an ounce of crude black carbolic acid (the same kind as in the preceeding case) about two hours before admission.

He was perfectly sensible but could not speak, pulse quick, skin clammy. He seemed to suffer intense pain in the œsophagus and stomach, and kept constantly expectorating viscid saliva; having already vomited several times, he was made to swallow a cup of warm water, followed by two eggs well beaten up, after which he made signs to show me he felt much relieved; he was then put to bed, and eggs beaten up with milk were ordered to be taken as long as he could swallow them.

He vomited several times during the night, the vomited matter smelling strongly of carbolic acid. Patient seemed much better in the morning, though deglutition was still difficult and painful. An ounce of castor oil was ordered, the eggs and milk to be continued.

On the third day his bowels were freely opened, the odour of carbolic acid being plainly perceptible in the stool, which was otherwise natural. A diet of bread, milk and eggs was ordered.

On the sixth day deglutition seemed much improved, as also the pain.

On the fourteenth day he was discharged cured.

The first of these two cases undoubtedly tends to show that death, in the early stage of poisoning by strong carbolic acid, is due to nervous shock brought on by the powerful action of the acid on the mouth, œsophagus and stomach, and I think it very probable that if instead of continuing on his beat for half an hour, the

patient had taken active measures to arrest the progress of the poison by emetics, and the administration of albumen, the case would have ended very differently.

In the latter case the man had vomited several times before admission, and as no symptoms of collapse had then taken place, I was enabled to administer warm water, eggs, and milk, so as to stop the further action of the poison, and in the morning a dose of castor oil was given, so as to clear out any of the poison from the bowels, as the albumen had then had sufficient time to neutralise the acid, and there could have been little danger of the poison being absorbed in its passage through the intestines.

Three cases of laudanum poisoning were admitted into the Infirmary, the first, a child aged five months, to whom laudanum had been given for the purpose of quieting it.

The second and third were in females of 17 and 20 years of age respectively, the poison having been taken for suicidal purposes.

Two cases of poisoning by acetate of lead.

One by petroleum.

One by laudanum and phosphorous paste.

One by sulphate of zinc.

One by turpentine.

One by iodine liniment.

Two by hydrochloric acid, a substance so rarely used as a poison that Orfila only mentions one case, and that not occurring under his own observation.

All the preceeding cases ended successfully under the ordinary treatment.

In conclusion, I may remark, that the late Act regarding the sale of poisons has had the effect of considerably lessening the number of poisoning cases admitted into the Infirmary, especially as regards laudanum, those that have occurred have been by substances hitherto rarely used as poisons.

NOTES OF CASES OF TETANUS.

By WILLIAM LITTLE, M.R.C.S. Eng.,
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Tetanus is one of the most difficult diseases to treat successfully that comes under the notice of the medical man, and therefore anything made public as regards its treatment, whether successful or not, is of the greatest use.

At this hospital, since its commencement, tetanus has been treated in almost every manner; and that which has answered best, in the opinion of the staff, is the mercurial treatment, carried to extreme salivation.

Since September, 1870, nine cases of Tetanus have occurred in this hospital; seven of which were of the traumatic variety, and two of the idiopathic. I propose giving notes of these cases.

Case I.—J. D., ætat 16, admitted into hospital on September 26th, under Dr. Nottingham, suffering from a severe compound fracture of the hand, extending into the wrist-joint, the soft parts being very much lacerated.

The hand was dressed with carbolic oil, and the boy went on very well until October 12th (seventeen days), when he complained of dysphagia, sore throat, pain in the back, stiffness in the jaws, more or less trismus, and other symptoms of tetanus. The wounds were looking at this time moderately healthy.

He was put on the mercurial treatment: one grain of calomel every two hours. Calomel to be sprinkled on the wounds, and ung. hydrarg. fort. to be well rubbed into the abdomen, the thighs, and the entire length of spine. In a few hours the tetanus was most severe. There was perfect trismus, opisthotonos, continued spasm, acute pain in the back and epigastrium, inability to swallow anything, well-marked risus sardonicus, and copious

sweating. Pulse 120; breathing rapid. About four hours from commencement of treatment, calomel was again sprinkled on the hand, and an enema of soap and assafœtida was administered. As regards diet, he could only allow a little beef-tea and milk to trickle between his teeth. In about twenty-four hours (October 13th) the calomel began to affect him; he had suffered dreadful agony during the twenty-four hours, and it was not until he was quite salivated that we noticed any diminution of the spasms, or that he felt any relief; the salivation was complete about the evening of the 15th, seventy-two hours after first taking the calomel. The calomel was continued every second hour for about thirty-six hours, after that it was given every four hours; the ointment was rubbed in about as frequently, and calomel was sprinkled on the wound morning and evening. Chloral hydrate in ʒss doses was given at bedtime, and this certainly appeared to ease him, but only for a short time. During the three days that salivation was being effected, the tetanic symptoms did not vary much, but I think they were as severe as I have ever seen.

October 16th. Pulse 120. He can swallow a little, and can open his mouth about an inch; much less pain in the back and neck; he slept for two or three hours last night, after taking the chloral; a great quantity of saliva running from his mouth; gums much swollen and bleeding. The spasms were much milder since last evening, and at longer intervals. He was now ordered to discontinue taking the calomel, but to continue its application on the wound, as well as the inunction, twice a day.

October 17th. He can open his mouth more than half the natural width. Pulse 100; breathing much easier; can swallow liquids without any spasm coming on; has had only two spasmodic attacks since last evening. Salivation is profuse. He is to leave off the application of calomel and unguent hydrarg. fort.; the hand to be covered with simple dressing.

October 19th. The boy can now open his mouth tolerably well; still complains of stiffness of the nape of the neck and jaws; says he feels as if he had been bruised all over; this is probably from the severe and long-continued contraction of the muscles. Breathing easy; can swallow well, and takes a pint of beef-tea and

milk night and morning. Pulse 100. The hand is going on well; he has lost his thumb and one finger; the remaining injured portion is gradually granulating up. From this time he progressed favourably.

Case II.—J. N., ætat 55, a labourer, was admitted into the hospital, under the care of Dr. Wollaston, in October, 1870, with a severe crushing and laceration of the soft parts of the whole forearm, and the lower half of the upper arm. The injured limb was dressed on the carbolic acid principle, and did remarkably well. A week after the accident he complained of sore throat, difficulty of swallowing, pain in the neck and jaws. Trismus, and all the usual symptoms of tetanus, began to develop themselves. He was ordered eight grains of calomel as a cathartic. A quarter of a grain of morphia was given hypodermically every four hours, until he became very drowsy, and could with the greatest difficulty be kept awake. In twenty-four hours the symptoms had become much milder; he could open his mouth much better; the stiffness had almost disappeared. He was now ordered the morphia, in the same doses and manner, three times a day. Under this treatment all unfavourable symptoms disappeared; and in a month the patient left the hospital.

Case III.—T. W., ætat 17, was admitted into the hospital, under Dr. Nottingham, on March 17th, 1871, with a very severe lacerated wound of the foot, about five inches long, extending from the posterior part of the heel, along the outer ankle, cleanly dissecting the whole of the soft tissues from the under surface of the os calcis. The edges of the wound were retained in apposition by hare-lip pins, and dressed with carbolic acid. The greater part of the wound united by first intention. But on March 30th it did not look so well, and appeared as if it would re-open. The patient complained of severe pain in it, as well as in his neck, also of stiffness in the jaws, and slight sore throat. There being suspicion of tetanus, he was put on the mercurial treatment, and ordered to take calomel, gr. iss., every hour. The inunction of the ung. hydrarg. fort. in the thighs, neck and abdomen every

three hours. An enema of aloes and assafœtida was administered directly, and lint saturated with liq. morph. mur. was placed on the wound as a dressing; his pulse at this time was 84; breathing rather quick.

March 31st.—He has perfect trismus, continued tonic spasm, with most violent exacerbations, complete dysphagia, very sore throat, and severe pain in the back and neck, and risus sardonicus. The pain in the foot was somewhat easier. With very slight alteration, these symptoms maintained their severity until April 2nd. The treatment was also continued.

April 2nd.—Salivation being complete, the calomel powders were omitted. The inunction was to be continued, and the wound was to be sprinkled over with calomel, instead of being dressed with the liq. morphiæ. His entire spine was blistered, and afterwards dressed with unguent. sabinœ. At this stage of the treatment the lad had much improved. He could open his mouth one-third of the normal extent; the dysphagia was less; the pain diminished; and the spasms milder, and coming on at longer intervals.

April 4th.—Pulse 90. He can open his mouth more than half the natural width, breathing easy, spasms very slight now, not more than three in the last twenty-four hours. Salivation is extreme, the mercurial inunction and calomel dressing to be omitted. He complains of sleeplessness, and was ordered fifteen grains of chloral, to be repeated at bedtime.

April 6th.—Can swallow much better, breathing easy. Can open his mouth pretty well now, but there is still stiffness of the jaw. Pulse 88, mouth very tender, complains of general soreness; slept for some hours after taking the chloral, which is ordered for every night at bedtime. There is hardly any general spasm left.

April 7th.—Except a little of the risus sardonicus (which remains more or less in all the cases of recovery I have seen), the lad has none of the tetanus left. From this period he rapidly recovered his strength, the wound went on well, and soon healed, and in about three weeks the only thing complained of was tenderness of the heel when walking. This soon went away, and he was discharged quite well.

Case IV.—E. L., ætat 61, a widow, was admitted into the Hospital, under Dr. Cameron, on January 25th, 1871, with idiopathic tetanus. The patient does not remember having received any injury, and there is no sign of any on the body. She has been living very badly for some time past, hardly ever tasting meat, having been much exposed to cold and wet, and very poorly clad. She first noticed the stiffness of the jaw on January 22nd, and then followed a little difficulty in swallowing.

The symptoms on admission were inability to open the mouth more than half-an-inch, extreme pain in head and face, dysphagia, much spasm coming on when attempting to swallow, or at the mere thought of it, and risus sardonicus. Only the muscles of the head and face were affected by the tetanic spasm. Patient is very feeble, has no appetite, and has a troublesome cough. Pulse 88; resp. 32. She was put under the mercurial treatment.

January 26th.—The jaw is more fixed, and the muscles of respiration are now included in the spasm. She cannot sleep, Pulse 96; resp. 32. The calomel, &c., is affecting the gums, therefore it, and the inunction, are to be omitted (ordered ℥ss. of castor oil, bowels being much confined).

January 27th.—Opisthotonos commencing, pain in the back, cough more troublesome. Pulse 100; resp. 28. To have an enema terebinthinæ, and the following mixture: ℞ Tinct. belladonnæ ʒiss.; aquæ camphoræ ℥viii.; m. ℥i. 4tis horis, and 10 grains of Dover's powder at bedtime.

January 28th.—Dyspnœa and spasm are increasing, and there is more opisthotonos. Left leg is quite stiff. On account of the dysphagia, an enema, composed of whisky, egg, and milk, was ordered every four hours. Mustard cataplasms were applied to the soles of the feet, and to the calves of the legs. Pulse 124; resp. 34. The belladonna was increased to ʒiii. in the ℥viii., and mxx. of liq. opii. sed. was to be given at bedtime, instead of the Dover's powder.

January 30th.—Slight delirium, tetanic symptoms somewhat milder. The rectum no longer retains the nutrient enemata, but, fortunately, the power of swallowing has more or less returned. The mist. belladonnæ to be omitted, and the following ordered:

℞ sp. æther sulph ʒiii.; aquæ camph. ℥viii.; m. ℥i. 2ndis horis; the spine to be blistered.

February 1.—Can open the mouth wider, swallow better, but very thirsty. This morning she has had rigors, followed by sweatings. She obtains sleep from the haust. opii. Two scruples of carbonate of ammonia were added to the mixture.

February 2nd.—Severe opisthotonos, more rigors. Patient very feeble. Pulse 100; resp. 40.

February 4.—Severe tetanic spasm, followed by acute febrile attack, came on last evening. There is laryngeal stridor, with hoarseness. Pulse 116; resp. 36. The last mixture was stopped, and two grains of camphor were given every two hours.

February 6th.—Respiration spasmodic. There is general bronchitis, which is much aggravated owing to the spasmodic contraction of the muscles of the chest. She can now swallow pretty well; the trismus is almost quite gone. Febrile attack during the night. Pulse 100; resp. 40.

February 8th.—To omit the camphor, and to have again the ammonia mixture. There is now no tetanic spasm, but she complains much of the cough.

February 10th.—Tr. camph. co. was added to the mixture.

February 12th.—Some amount of spasm has returned. She was ordered a mixture containing iron and ether.

February 18th.—She has steadily improved since last note; all the tetanus has gone; can now eat solid food. Quinine added to the mixture.

February 24th.—Not so well; breathing is getting hurried. The patient's strength is giving way, probably owing to the copious discharge from a large bedsore on the sacrum. There has been no recurrence of the tetanic spasm, and, although slight improvement continued after this for a short time, the patient grew weaker, and died on March 22nd.

At the *post mortem* examination, the brain and spinal cord were carefully examined, and no appreciable lesion could be found. The lungs were congested, the bronchial tubes contained some thick, greenish mucus. The other organs were healthy.

The probable cause of the tetanus in this case was exposure to

cold, and the want of proper nutrition. Whatever may have been the immediate effect of the remedies administered, it is difficult to say to which, if to any, we could ascribe the subsidence of the tetanic symptoms. As will be seen by the report, there was no improvement manifested on the appearance of the mercurial action, which was developed with more than usual rapidity.

From the belladonna, followed by camphor, benefit seemed to be derived. The power of deglutition returned during this time, and the general tetanic symptoms had nearly subsided, when, owing to the severity of the pulmonary complication, carbonate of ammonia was substituted for the camphor. After this her improvement progressed satisfactorily; she ate well, slept tolerably when not troubled with cough, and her condition was such as led us to hope for a favourable termination.

The change which subsequently occurred was principally ascribed to the depressing effect of the large bedsore, which had formed during the early part of her illness; this, in fact, seems to have been the immediate cause of the fatal result, to which the bronchitic complication, however, must have contributed.

Case V.—T. L., ætat 30, was admitted on October 4th, under the care of Mr. Hamilton, suffering from a severe burn over the entire back and abdomen. The burn was dressed with carron oil, afterwards with ung. zinci. The patient went on well for seventeen days (October 21), when he complained of cold, pain in the neck, jaws, and epigastrium, hoarseness, and slight stiffness of the jaw. These symptoms were suggestive of tetanus coming on, and, without delay, he was ordered two grains of calomel every two hours, the denuded surface on the back to be sprinkled over with calomel, and the remaining surface of the burn to be dressed with an ointment composed of ung. hydrarg. fort. one part; ung. calaminœ four parts. The man was put on a pint of beef tea and milk night and morning, with soup for dinner.

October 22nd.—The symptoms are now very severe; opisthotonos, intense pain in the back and neck, and stiffness in the jaws, trismus complete, one continued tonic spasm, with violent exacerbations, dysphagia, copious perspiration, pulse and respiration

very frequent, risus sardonicus well marked. The treatment was continued, but the calomel was ordered to be taken every hour, and the mercurial ointment to be used in the form of inunction into the thighs, neck, and jaws every three hours, the burn to be sprinkled again with calomel. At this time he could hardly swallow anything, and, being very exhausted, he was ordered a brandy and beef-tea enema every three hours. On the evening of this day he was much worse; the calomel had only slightly affected his gums, though it had been given so frequently. The symptoms got more intense, and he expired on the morning of the 23rd, or forty-eight hours after the commencement of the disease, suffering all the time the most intense agony. He died in the middle of a severe convulsion. The *post mortem* examination showed great congestion of the brain, spinal cord, and membranes.

Case VI.—D. D., ætat 29, a widow, was admitted under the care of Mr. Hamilton, on February 27th, 1871. She was then in an advanced stage of tetanus, which had commenced about thirty-six hours previously. Some three months before this she had bruised her right leg. Two ulcers had followed this, which had been dressed with "green ointment." For a week or so previous to the tetanus appearing, these ulcers had been very painful. They had now the appearance of irritable sores, with a thin ichorous discharge. She had, on admission, perfect trismus, severe tonic spasms, and a semi-asphyxiated appearance. Respiration very difficult, with a quick and very feeble pulse; great pain in the back, neck, and abdomen. I thought her in a moribund state when admitted. She was put to bed, and stimulants by mouth and rectum were administered. When some reaction had taken place, she was ordered calomel, gr. ij. every hour. Ung. hydrarg. fort. was rubbed into the neck, thighs, and abdomen every three hours. Brandy and beef-tea enemata were administered every two hours, as she had almost complete dysphagia. The tetanic symptoms increased in severity, and the blueness of the face got more apparent; she became gradually asphyxiated, and died about eight hours after her admission, and

about forty-five hours from the commencement of the tetanus. No *post mortem* examination was allowed in this case.

Case VII.—A. P., ætat 32, married, was admitted into the hospital under Dr. Nottingham, on March 16th, 1871, with a compound fracture of the ankle-joint. She went on well for about five days. The wound had been dressed with carbolic oil from the first. On March 21st, she complained of sore-throat, pain in the back and neck. The ankle became very painful, and the wound looked inflamed and sloughy. Stiffness in the jaws, and partial trismus, soon developed themselves, with violent contractions of the muscular system. She was ordered calomel, gr. ij. every hour, and the inunction of the strong mercurial ointment every three hours.

March 22nd.—Complete trismus, tonic spasms, and great pain in the back, &c. In the evening of this day (about twenty-eight hours from commencement of the treatment) her gums were slightly tender, the trismus had abated a good deal, and she could swallow beef-tea and milk pretty well, and yet she was very weak. Pulse 110, feeble. A tablespoonful of brandy was ordered every two hours. To continue the mercurial treatment.

March 23rd.—She takes plenty of nourishment, but appears to be sinking. Though taking the calomel every hour or so up to this time, she does not appear to be suffering from the usual effects of mercury, or only in a slight degree. The symptoms in this case, though severe, were not nearly so acute as the other cases of traumatic tetanus. She did not recover from the great exhaustion she was under, and died on the evening of the 23rd, or about sixty-four hours from the beginning of the tetanus, all the symptoms of the disease being present, but not at all severe.

The *post mortem* revealed intense congestion of the brain, spinal cord, and the membranes of both. Fluid was present in the cerebral ventricles, but nothing else worthy of note.

Case VIII.—G. P., ætat 61, a seaman, was admitted under Dr. Nottingham, on May 19th, 1871, suffering from tetanus erectus, which variety of the disease was maintained during his

entire illness. After carefully examining his entire body, as well as cross-examining the patient and his friends as to any injury received by him, we failed to find any, and therefore diagnosed it as a case of idiopathic tetanus. The erect form this case took was interesting. He could not sit down, and had to stand upright in the cab that brought him to the hospital.

Some three days or so before his admission, he noticed stiffness of the jaws, and slight dysphagia, with sore throat. These symptoms increased gradually, and on the 19th April, when admitted, were most acute. He had a most careworn and distressed appearance, and the whole muscular appearance was affected with severe spasm. He was sweating profusely, the perspiration having an acid reaction. There was almost complete trismus; great pain in the back and neck; also much thirst and inability to swallow. He appeared thoroughly exhausted. Pulse 96; respiration 24; temperature 99 Fah. He was placed in bed, and ordered the following treatment: ℞ calomel gr. ij.; pulv. opii. gr. ss.; ft. pil.; 2ndis horis. Inhalation of chloroform was administered, and relieved him immensely. The ung. hydrarg. fort. to be rubbed into the thighs and abdomen every three hours. The entire length of the spine was blistered; an enema of turpentine was administered. Beef tea and milk was ordered to be given in small quantities, if possible.

April 20th.—The patient is weaker; did not sleep during the night; has not been able to swallow anything. During the night has had two brandy and beef-tea enemata. Spasm most acute, and with frequent exacerbations. He can open his mouth a little more; legs are drawn apart to the utmost. Pulse 120; respirations 24; temperature 100·3. Ordered to continue the treatment, and to have the nutrient enemata every three hours. In the evening, on account of the intense agony, fifteen grains of chloral hydrate were given, which seemed to relieve him for a short time. The chloral was repeated at midnight. At this time his pulse was 140; respirations 28; temp. 101.

April 21st.—He can open his mouth about one-third; spasms much milder, and not so frequent; has less pain; is getting weaker. Pulse 140; very feeble, and slightly intermittent; resp.

28; temp. 102·2. The mercury was now affecting him, and he was ordered to take it in the same doses every four hours, and to continue the mercurial inunction. The blistered spine to be dressed with ung. hydrarg. fort. Nutrient enemata to be continued. In the evening he began to wander; very little general spasm, but more trismus. Pulse 140; resp. 36; temp. 102. About midnight he died rather suddenly, thoroughly exhausted, and partly asphyxiated. A *post mortem* examination, made twelve hours after death (in this case the man was placed on his face from the first on the dead-house table), revealed fluid in the cerebral ventricles; intense congestion of the brain, spinal cord, and membranes. Most congestion about medulla oblongata; the remaining organs healthy, except being congested.

Case IX.—T. C., ætat 42, a seaman, was admitted an inpatient, under Mr. Hamilton, on June 16th, 1871, with a badly crushed hand, having been run over by a railway truck. He was very drunk. The hard and soft structures of the entire right hand were completely smashed, except a small piece of the palm. Amputation at the wrist was advised directly, but he resisted most obstinately the advice of all; therefore the hand was put in as good position as possible, placed on a splint, and dressed with carbolic acid. The injury went on as well as could be expected until June 19th, when it looked very inflamed and sloughy. The next day (June 20) he agreed to have it taken off, which was done at the middle of the forearm; all the tissues anterior to this being much swollen, inflamed, and œdematous. At the time of the amputation there was a suspicion that tetanus had commenced, but no decided symptoms appeared until three days after (June 23), when he complained of sore throat, slight trismus, and great pain in the stump, which was rather spasmodically flexed. He was ordered four grains of calomel, with ten grains of Dover's powder. In the evening the powder was repeated, the trismus being now more evident. There was tonic spasm of the muscles, with copious sweating, and intense pain in the stump, which was dressed with carbolic acid. This dressing was left off and a linseed poultice applied, and he was ordered the following: Two grains of

calomel every hour, and the inunction of the ung. hydrarg. fort. on the abdomen, thighs, and axillæ. Pulse 108, and feeble. He takes one pint of porter night and morning, and one pint of milk and beef-tea two or three times a day. The difficulty in swallowing was very slight until the last day.

June 24th.—The stump is flexed to the utmost; severe opisthotonos; most acute pain in back and neck; complete trismus. Spasmodic exacerbations come on very frequently. The stump looks sloughy, and the arm is much swollen and inflamed. Pulse 120; resp. 28; temp. 99. Spine blistered, and dressed with ung. hydrarg. fort.

Evening 24th.—Can open his mouth a little better. Pulse 128; temp. 98·8°.

June 25th.—Forearm still firmly flexed; cannot be straightened; surface of stump is a little healthier; spasms less severe, and he says he feels better. Pulse 140; temp. 98·2. He cannot swallow so well. Treatment continued, and the jaws to be blistered. As he does not sleep, twenty grains of hydrate of chloral were administered.

Evening.—Spasms more severe; opisthotonos. Through the dysphagia being now present, beef-tea enemata were ordered every three hours; thirty grains of chloral were given, and some relief followed this. Pulse 140. Gums are very tender; saliva running from his mouth.

June 26th.—Can open his mouth one-fifth of an inch; much salivated; spasms are as frequent and severe. He is becoming rapidly exhausted. The mercurial treatment omitted, and chloral, in half drachm doses, ordered every four hours. He cannot swallow at all.

Evening.—He experiences great relief from the chloral, and can open his mouth wider after the chloral than before taking it. Pulse 180; resp. 50.

June 27th.—Is dying. Pulse 132; temp. 98·4. He expired in a convulsion at noon.

Post mortem made ten hours after death. The brain, spinal cord, the spinal membranes and medulla were more intensely congested than any I have ever seen.

All the cases recorded (excepting Case II.) were similar, inasmuch as they were of the most acute character; the injuries in each case were also of a very severe nature, and such as were most likely to cause tetanus. The fact of the cases being acute was certainly not favourable to a successful termination.

Only two of the patients were of a youthful age, and these recovered; the recorded cases of recovery from tetanus being greatly in favour of young patients. Tetanus has appeared very frequently at this hospital, and almost every remedy recommended has been tried; and has failed, I may almost say, in every instance. About three years ago, two lads recovered, who were treated mercurially; and after this, every succeeding case has been similarly treated, and though this treatment has not succeeded as well as we could wish, it has certainly answered better than anything else.

One great point is, to begin the treatment on the first suspicion of the disease, and obtain salivation as soon as possible. The patients who recovered were soon affected; those who died, withstood the action of the mercury for a long time, and, even at the last, were not properly under its influence. Whether tetanus has the power of rendering the system more or less capable of resisting mercurial action, is an interesting point; my opinion is, that it does possess some such power. Another fact is, that in this disease young people are sooner salivated than adults, though it is generally understood to be the contrary in other cases.

The fatal cases have all experienced relief when salivation has been effected; the trismus, dysphagia, and general spasm abating to a considerable degree; the cause of their death appearing to be exhaustion. Altogether, the result obtained encourages us to prosecute the mercurial treatment further, with careful clinical observation, for, unfortunately, the results of post mortem examinations help us hardly at all.

ON DIPHTHERIA.

BY FREDERICK P. WEAVER, M. D.

The object of the following remarks is to call attention to a well-known fact, viz., the obscurity of the origin of certain cases of diphtheria. I allude to cases which are unquestionably instances of diphtheria. We frequently meet with "betwixt and between" cases, where, apparently as the result of a common cold, there is swelling of the tonsils, and on these organs, and especially in their cavities, are seen little points of white exudation, like mucus, or like bits of white of egg; but these points do not coalesce and spread, and do not remain more than a day or two. Such instances we do not call diphtheria.

In the true disease there is exudation in one or more places, on one or both tonsils, on the pillars of the fauces, or on the uvula, which exudation is thick, whitish, and adherent, and tends to spread more or less to the neighbouring parts, and there is at the same time more or less fever. Under this type of true diphtheria we find two classes of cases—the one originating in contagion, the other apparently not so.

The first class—or that originating in contagion—seems to have much affinity to scarlet fever. We can often trace the origin of the first of a group of cases to some similar case at a distance. Perhaps several in a family, and several families living near one another, are attacked. A patient removed to another house carries the disease with him, and other persons in the second house will suffer. Children seem most prone to the complaint. There is sometimes a rash, more or less resembling scarlet fever, and this is followed by desquamation. Sometimes the urine is albuminous; in fact, the course of the disease is so like scarlet fever as to suggest that it is a modification of, or something grafted on, that

disease. This connection between scarlet fever and diphtheria is insisted on by some distinguished physicians. The late Dr. Addison used to say "he did not understand diphtheria, it seemed a mule of scarlet fever." The disease, however, is a different one from scarlet fever. It occurs in those that have had that complaint; and the disease taken by a person exposed to the contagion of diphtheria, assumes the diphtheritic type more than the scarlatinous.

This disease is severe, and often fatal, primarily or secondarily. I find that out of eleven cases of which I have some notes, in children ten years old and younger, five died,—two from laryngeal symptoms, one from bronchitis, one from congestion of the brain, and one from purpura. Both grown-up persons and children visiting these cases may take the disease.

But, besides this first class of cases of true diphtheria, which seem decidedly contagious in origin and result, we meet with a second class, little (if at all) contagious. Daviot makes this distinction, and states that diphtheria is not contagious except when complicated with exanthems. It is to this second class of cases I more particularly wish to direct attention. We now and then meet with diphtheria in a sporadic or endemic form. We are quite unable to trace the case to any previous case; perhaps two, three, or more persons in a house are attacked with varying degrees of severity; by and bye the disease leaves and no one else takes it. This is not the history of a contagious fever; it more resembles that of some disease of local origin.

I join in the opinion of those who hold that these cases arise from defective sanitary arrangements, especially from drainage emanations. Such emanations may arise from a faulty water-closet or cesspool, from a housemaid's sink pipe or bath-room pipe when untrapped, and stopped up either by their own contents or by frost, also from the near neighbourhood of a foul privy. I can hardly remember one of these cases in which some such defect was not found on enquiry, or, at all events, in which there was not a possibility of such defect.

Of sixteen cases furnished by my memoranda, I find in two there was a defective water-closet. In two other mild cases in

neighbouring cottages, there was offensive liquid from pigsties close to the back door. In three cases in one house (schoolmistress, usher, and servant), commencing within five days of one another, there was a most offensive cesspool outside the back-kitchen; the pipes were stopped, causing the offensive fluid to flow on to the floor. In two slight cases—a housemaid and little girl—there was a leaking water-closet pipe passing through the pantry, contaminating the soil of the floor, and very mal-odorous. In another case—a housemaid—there was a stopped-up untrapped sink pipe in the pantry. In the case of a child (severe, with nasal speech, regurgitation of fluids, and weakness of legs), there was a large peculiarly offensive privy in a yard adjoining the house, which privy, I have no doubt, was resorted to by the child for playing in. In five cases in one house, three young ladies and two servants were attacked nearly at the same time; one of the ladies (a severe and prolonged case) had nasal speech, regurgitation of fluids through the nostrils, and weakness of the limbs; another of them had a mild throat attack, but in her a blistered surface took on diphtheritic action, and was very long in healing. It was very difficult to assign a cause for this outbreak; a fair supposition was, that drainage emanations had got into the bath-room and bedrooms from an untrapped bath-pipe, the outlet pipes being stopped up by the frost. The persons attacked were those who had most communication with this part of the house, the other inmates escaping entirely.

It has seemed to me that of the persons attacked by this form of disease, those who were quickly removed from the influences of the supposed cause, or in whose cases the drainage defect was speedily put right, got well sooner than those in contrary circumstances. I do not find one case of this form of diphtheria communicated to persons simply visiting the persons attacked and not exposed to the assigned cause, viz., foul emanations.

When two, three, or more persons were attacked, they mostly showed symptoms of the complaint nearly at the same time, too nearly together to make it probable one had taken it from another. I find, too, that far the larger number of the patients (thirteen out of sixteen) were females, who, by household duties, are much more

within doors, and consequently more exposed to any "endomic" disease; and that, even of the females of a house, those were attacked who had most to do with the rooms containing the foul emanations.

There are not wanting plausible suggestions why foul emanations should produce such a disease as diphtheria. It seems probable that foul material in inspired air is more or less absorbed by the nasal mucous membranes, and possibly by that of the pharynx, that this should produce irritation of these parts, and excite the set of symptoms we call diphtheria. We find that the foul odours of the dissecting room are liable to affect the throat. I am informed by Mr. Colley, of Guy's, that one of the first symptoms shown in the hospital of suffering from overwork, in dressing wounds or dissecting, is a sore throat, which, from his own experience, he would say was due chiefly to the enlargement of the tonsils. Here is a case apparently of foul material in the air absorbed by the upper part of the respiratory mucous membrane, and producing local irritation, to be, doubtless, followed by more general symptoms if the inhalation be further persisted in.

The coryza attending hay-asthma is an instance of local irritation of the upper part of the air passages, derived from irritating matters in the air; and, in fact, the coryza in a common cold is from the local irritation produced in the same parts by irritating air, viz., air of an unsuitable temperature.

Again, the theory that diphtheria may be excited by breathing drainage air, is quite analogous to the theory that typhoid fever is excited by drinking drainage water. There is some resemblance between the structure of the tonsils and that of Peyer's glands; and the affection of the tonsils in the one case, bears some analogy to the affection of Peyer's glands in the other. On the whole, however, I do not assert that there is *proof* of a connection between diphtheria and foul emanations; but only a presumption of such connection, derived from practice and theory, requiring further observation to confirm or refute it.

This presumption is sufficient to make us watchful for sanitary defects when sporadic or endemic diphtheria occurs, and at once to get the patient out of the pernicious influence either by complete

removal of the defect, or by removal of the patient. It is, further, a matter of great importance to observe whether this form of the disease is, in the true sense of the word, contagious; for instance, whether a patient who has acquired the complaint in one house, and is removed to another, can carry contagion with him to the inmates of the second house. I am much disposed to think he can not carry it.

With regard to treatment, there is little to add to the suggestions of Sir W. Jenner and others. I do not think strong local applications arrest the disease or do any good, and they may do harm. I prefer a moderate application of tincture of sesquichloride of iron, weak muriatic acid, or nitrate of silver, along with chlorate of potash used as a gargle, and swallowed, or a gargle of Condy's Fluid, and the internal administration of tincture of iron, with or without quinine. The throat should be steamed, cotton-wool, with belladonna liniment, applied externally, sufficient nourishing diet given, and pure air admitted, with the free use of disinfectants in the patient's room.

NOTES OF A CASE OF POPLITEAL ANEURISM TREATED BY COMPRESSION.

BY G. E. WALKER, F.R.C.S.

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On the 21st of December, 1869, I was called to see a middle-aged gentleman, who stated that he had hurt his knee in getting out of a railway carriage some three or four hours before. I found the usual signs of a popliteal aneurism, about the size of a small egg. The mode of origin is worthy of notice. In descending from the carriage, he purposed placing his left heel on the step, but his attention being suddenly diverted, the heel slipped in front of the step and he was brought up by the toe catching the station platform, and sustaining the momentum produced by the fall of a man about fourteen stone weight. He thus unconsciously imitated the operation for producing rupture of the popliteal artery, which Richerand performed on the dead subject, namely, by violent and extreme extension of the knee.*

In forty-eight hours, in spite of the use of tourniquet, digital pressure and flexion, the aneurism had increased in size so as to bulge out considerably beyond the lateral and posterior boundaries of the ham, and to extend $2\frac{1}{2}$ inches above the adductor opening. The rapidity of the enlargement led me to believe that there had been rupture of the outer, as well as of the middle and inner coats of the artery, though if so the aperture must have been at first very small.

On the fourth day the aneurism and the treatment together had produced such distress as to induce me to request Mr. Stubbs to see the case with me, and to urge the propriety of ligaturing the superficial femoral. Mr. Stubbs' advice, however, was to continue the pressure. Up to this time we had endeavoured to keep up

* Hodgson's *Treatise on the Diseases of the Arteries and Veins*, p. 64.

continuous pressure day and night, but owing to the bad state of health of our patient, superadded to the ordinary difficulties of the process, we had been unable to prevent the increase in size before mentioned. There was also great œdema of the whole limb, and much engorgement of the vessels leading to the popliteal vein. Much of this was, doubtless, due to the compression of the femoral vein, involved necessarily in that of the artery. The walls of the sac had, however, attained some degree of strength, so that after a six hours' rest, rendered absolutely necessary by the distress of the patient, the aneurism had not further increased, and much of the swelling of the limb had disappeared. We could now apply pressure only very partially, and for some weeks this was the plan. At bedtime the leg was bent on the thigh as far as could be comfortably borne. He could never tolerate for more than a few minutes such an angle as would ensure stoppage of pulsation ; still, we were able to lessen pulsation slightly on some occasions for several hours. In the morning he was moved to a low iron bed, which had a framework at each end about $2\frac{1}{2}$ feet high. Between these a half-inch manilla rope was tightly stretched, for the double purpose of supporting, and by its elasticity enabling us easily to vary the power of, the weight employed. The weight was made up in this fashion : a disc of brass, $1\frac{1}{2}$in. in diameter, had a stout pin 6in. long screwed into its centre ; leaden weights of various convenient shapes were threaded on this pin ; to the bottom of the disc was glued an India-rubber hemispherical air pad, covered with wash leather, and a stout string connected the top of the pin to the rope, the object of the whole being to maintain closure of the artery with the minimum amount of pressure. The weight directed diagonally against the edge of the pubic ramus could be borne with comfort for about four hours, but in practice we found objections to its use which led to its discontinuance. The slightest lateral movement on the part of the patient would throw it off, and such was the delicacy of the balancing that under a minute increase of blood pressure, as in coughing or sneezing, the weight was lifted, and pulsation caused. In the afternoon the patient was changed to a sofa, and had on a Signorini tourniquet, or controlled the pulsation by flexion, or still better by crossing the affected limb over the

other and placing a tightly-rolled towel underneath the aneurism. This was the treatment carried out, with a few unimportant variations, for many weeks. A tourniquet, with elastic bands, though made by one of the best surgical mechanicians, proved utterly useless; the old horseshoe, with an air pad, answered very fairly.

It will be observed that we were trusting to the intermittent pressure treatment so much extolled by the Dublin writers; and although we did not cure the aneurism by it, we lessened its size so considerably that on the 27th of March, when, owing to an attack of acute rheumatism, we were compelled to refrain from all surgical treatment, the girth of the joint was only one inch more than that of the sound limb, the pulsating tumour being about $2\frac{1}{2}$ in. in diameter. For the next fortnight the rheumatism afforded us sufficient occupation, and no attempt was made to control the aneurism, as, indeed, none could have been tolerated. When we again began to attack it, we found some little increase in size, and having now lost all faith in the three sorts of treatment we had tried, namely, intermittent pressure, incomplete pressure—that is endeavouring to shut off almost, but not quite, the whole current of blood to the sac, which I had attempted by using the delicately-balanced weight—and, lastly, the let-alone treatment to which we had been driven by the rheumatism, I tried to induce my patient to submit to continuous pressure. Such, however, was his dread of the repetition of the torture which he endured in the first four days of his illness that, though endowed with exceptional powers of endurance, I could not persuade him to make the attempt until the 5th of May, when he consented.

For the first few days no alteration was made in the mode of applying pressure; it was merely made more continuous, but after that the delicately-balanced weight was laid aside, and a block tin weight of 14lbs., shaped like a rifle bullet, was substituted.* It was kept in position by means of a rod screwed into its flat end and made to pass through a hole in the apex of an elliptical arch of steel springing from a hollow pad, on which the thigh rested. The hemispherical end was placed diagonally against the pubic ramus;

* *Vide* Dr. T. H. Watson, in *Edin. Med. Journal*, May, 1869.

it effectually controlled the artery, and had several pounds to spare for emergencies.

After sixteen days of this treatment I found the aneurism smaller, but no signs of its occlusion; it was soft, and there was a considerable space unfilled by clot. For reasons detailed below, I now, after procuring another weight, differing from the one already in use by being about some $2\frac{1}{4}$lbs. heavier, and having a more conical apex, so as to sink deeper into the soft parts, proposed to make pressure on one artery alone—the common femoral, alternating between the pubic ramus and just above the bifurcation of the vessel. We had even with improved appliances great difficulty in compressing the vessel; the groin was sore, the glands were enlarged, and there was great pain down the course of the artery. Changes in the weights had to be made frequently; they were rendered more tolerable through being cooled by a freezing mixture, but it required all the untiring energy and patience of Mr. F. Young, who assisted me throughout the case, to keep up pressure at all, and in spite of every possible care, the horse-shoe tourniquet, in order to give a rest from the weights, had to be fixed on the superficial femoral several times—a course which, I believe, involved actual retrogression.

On the night of the 23rd, whilst being changed from a hard bed to a soft one, the patient extended his limb violently, throwing out of gear the tourniquet, which had been temporarily adjusted to permit the removal, and thereby caused the aneurism to pulsate fully as much as it had done three weeks before. All our labour seemed, therefore, to have gone for nothing. Next morning showed no change, and at noon, being sick with disappointment, our patient wished to be left to die in peace. To allow him a little time to recover, I removed weights and everything, and laid the limb in a comfortable position, with a cushion under the aneurism and a sandbag over the knee to limit the pulsation. He had then some food and wine, and, without being made aware of it, for he had a great objection to the drug, a grain of morphia. He fell asleep at once, and in half-an-hour the weight was replaced on the groin; in two hours he awoke much refreshed. The heavier weight was placed on the lower spot, and another grain of morphia adminis-

tered. With the exception of a very few minutes, during which time he was in a sleep, almost comatose in character, I sat by him from one p.m. to eight p.m. with my fingers and thumb embracing the aneurism, so that I was perfectly certain no blood had passed beneath the weights, which were changed with the greatest care. Towards five o'clock I had the satisfaction of feeling the previously flaccid sac gradually fill out and harden, and at eight, when I left, matters appeared so promising that I ventured to prophesy, could pressure be kept up for another seven hours, the cure would be complete. At nine another dose of morphia—half a grain—was given, and again the patient slept.* Towards midnight the nurse in changing the weights, thought the pulsation had stopped, and soon afterwards, on Mr. Young coming on watch, he established the fact conclusively. As matter of precaution, the pressure was kept up during the night; the patient, now that his six months' anxiety was relieved, bearing the physical discomfort with comparative ease.

The considerations which led me to alter the method of pressure were these. The Hunterian operation, as a rule, causes consolidation of the aneurism in a few hours; if then we could make compression act in the same way as ligation, we might expect similar good results. I therefore followed up the steps likely to take place after the application of a ligature to the superficial femoral, as being the artery in which I had an immediate interest, reasoning thus, the blood would pass in increased volume down the profunda and through its anastomoses with the superior articular arteries and the muscular branches of the popliteal, with the inferior articular, and with the anastomotica magna. By means of some of these vessels, according to the position of the aneurism, the blood would reach the diseased part of the vessel either from above or below, but, whatever the direction, the current would be at first a mere trickle, drop by drop, and as the coagulum already in the cavity is rough, there would be present the most favourable conditions for the sealing up of the vessel, namely, a current not

* The weights were changed according to the patient's feelings; he could bear the lighter weight on the groin for some two hours, and the heavier below the groin rather less than one.

strong enough to make its way through the aneurism, and, opposed to such current, a rough surface highly provocative of coagulation.

Now to make compression act as ligation, it seemed that one had only to make it continuous. But as I had been doing this as well as possible for more than a fortnight without success, I felt there must be a condition unfulfilled of which I was yet unaware. As I had reasoned out the effect of the ligation, so I did of the compression method which I had used. Granting that my pressure for the time being was perfect, this would be the result. After, say four' hours (an extreme) closure of the artery at the groin, I should expect the blood about to seek a new channel by means of the anastomoses of the gluteal and circumflex iliac arteries above, with the various branches of the profunda below, and therefore, to reach the aneurism through the profunda — its ordinary current being reversed — and the superficial femoral. But before this new channel could be made available, –for it takes some time to make a collateral circulation, as I will show further on,—the pressure would be shifted from the groin to the mid-thigh, where the superficial femoral would be compressed, and the onus of forming a fresh channel transferred from the capillaries of the branches of the internal iliac, and the ascending offsets of the profunda, to the descending branches of the last-named vessel and its anastomoses, with the anastomotica magna and the muscular and articular branches of the popliteal. Now, supposing the change from one artery to another to be made too quickly to allow of the production of an efficient collateral channel for either artery, I was driven to the conclusion — always supposing the pressure was complete — that it was possible to starve an aneurism, and therefore to increase its cavity. For I believe a process of absorption, similar to that which takes place after the consolidation of an aneurismal sac, is constantly going on during what may be styled the life of an aneurism. The clot is a foreign body, which nature is always engaged in removing. When, however, the blood has free access to the sac, the deposition of new material takes place with greater rapidity than the removal of the old, and, therefore, the aneurism increases in size.

This explained what had puzzled me before, namely, the station-

ary condition of the aneurism during the months of intermittent pressure, and the fact that, after a fortnight's continuous pressure, though the aneurism was smaller it was softer, and a very short time of free access to it of the blood sufficed to render pulsation as vigorous as it was weeks before.

The next deduction was obvious. As I could not keep the weight on one spot long enough to produce the desired effect, I must, in changing it, so choose my second site as to keep up the formation of the one collateral circulation which I had begun. I therefore used pressure only on that small portion of vessel bounded above by the inner margin of the pubic ramus, and below by the origin of the profunda.* Treatment according in intention with this reasoning was begun effectively three days before the final act. I believe some of this time was wasted, firstly, because many times the weight was raised to see the condition of the aneurism, for it was impossible at once to convert patient and assistants to the necessity of obedience to the requirements of the theory; and secondly, to the unfortunate accident by which two days' very hard labour was almost completely spoiled. For the latter, I was responsible, as it was done whilst I was removing him from one bed into another with the well-intentioned idea of giving him a good night's sleep. Unhappily, I caused him so much pain that he extended the limb violently, and started the pulsation in all its old vigour. Doubtless by this time the new circulation was almost finished, for the filling and hardening of the sac began next day, very soon after pressure was again efficiently used.

Such then are the considerations which led me to adopt the treatment by pressure on one artery. I wish now to notice some conditions which influence the duration of different cases. The chief of these are the condition of the blood, whether favourable or otherwise to the deposition of clot, the degree of elasticity of the arteries, and the facility with which nutritive change can be accomplished.

As illustrations of the first, I may mention purpura and scurvy, in which diseases one would scarcely look for the cure of aneurism,

* I believe this was left quite clear, for the heavy weight was borne best just below Poupart's ligament, and not at the apex of Scarpa's space, where therefore it was not fixed.

and in that mysterious condition of system, the subjects of which get the suggestive title of "bleeders," we should be probably disappointed. But there are most likely other systemic phases less defined than these three, which, whilst they do not prevent entirely, make the process of coagulation very slow.

As a rule, I should think the second and third conditions of more practical interest, for, supposing that the blood, as mostly happens, is in a tolerably favourable state for clotting, the cure of the aneurism will depend on the relative facility for the formation of a collateral circulation, and this, of course depends on these two conditions. Probably in very young people, with perfectly healthy vessels, — and therefore unlikely subjects for aneurism, — the elasticity and contractility are such that, by the dilating power of the longitudinal muscular fibres, and the peristaltic action of the circular, blood can be at once sent through the ordinary anastomoses when a large trunk is stopped.

But the very fact of the presence of an aneurism may be taken as proof that arterial degeneration exists to some extent, and, therefore, one would not expect normal elasticity or contractility. Nutrition also, by which alone permanent change can be made in the calibre of the anastomosing vessels, must be in such cases slow; and herein we have an explanation of the variable periods required for the cure of aneurism in different individuals subjected to the same treatment.

Hodgson says he has tied the main artery of a limb, and then injected the parts beneath through the upper part of the vessel. He does not state the age of the body whence he took his limb, nor whether the pressure which he used was the same as that of the living heart; and then, again, the vessel may be more dilatable after death than during life.* Further on he states, that in an old man who died four days after ligation of the external iliac for inguinal aneurism, after injecting the artery above the ligature, he found the wax had passed by numerous anastomoses from the branches of the internal iliac into those of the profunda, such anastomoses being so minute that only a few were capable of being traced. "*The injection had not sufficiently succeeded to fill the*

* *Op. Cit.*, p. 239.

femoral artery," so that it would appear in this case four days were not sufficient for the production of an effective collateral circulation. He cites also another instance, in which Sir Astley Cooper* was unable to inject through the crural the parts below, *several weeks* after the Hunterian operation for popliteal aneurism.

In a case of embolism of the popliteal artery, occurring in a man aged 34, which I brought before the Liverpool Medical Society last winter, there was no perceptible enlargement of the collateral vessels when I saw him twenty hours after. I believe this very long period was due to the closure of the popliteal not being complete in the first instance, for the man described the pain in the calf as coming on gradually, and even at this time I could detect a slight pulsation in the dorsal artery of the foot. Forty-eight hours after this, when I next saw him, the collateral vessels on the front and sides of the knee were pulsating vigorously enough to be perceived with the eye as well as the finger.

I think it right to call attention to this because a recent advocate of the "rapid method," — indeed, I may say its originator, Dr. Murray, — has laid down, in what appears to be meant for a general proposition, that "aneurism can be cured by coagulation of blood;"† as I understand it, coagulation "en masse." Certainly many aneurisms have been cured in a few, indeed a very few hours, and by coagulation of blood, though how that coagulation be effected is still a moot point; but I do not believe that all aneurisms can be cured in a few hours.

Dr. Murray speaks under the inspiration of his well known and admirable cure of an abdominal aneurism, in a strong man, 26 years old, who therefore, possessing rapid nutritive change and good coagulative power, was a likely subject for quick cure. From the position of the aneurism, a little above the origin of the iliacs, only one site of pressure was possible. At first it was used for two hours only, and then without visible improvement; three days after it was kept up for five hours, during the last one of which pulsation had diminished greatly, and when the instrument was removed finally, it was found to be so feeble that a speedy cessation

* *Op. Cit.*

† *Rapid Cure of Aneurism*, p. 12.

was looked for, and not in vain, for it stopped altogether a few hours afterwards. As far as I can judge, Dr. Murray, and others after him, believe this to have resulted from a coagulation, *en masse*, of the blood which was in the aneurism at the moment of application of the tourniquet. I would respectfully submit that the cure was accomplished in the ordinary manner, by a collateral circulation and the gradual formation of a clot, and not by mere stagnation. It is evident, from Dr. Murray's Plate III.,* that the aneurism would receive from the superior mesenteric artery, through its inosculations with the inferior mesenteric, which sprung from the aorta almost in the centre of the sac, a sufficient amount of blood to form a plug. Indeed, once the pressure was complete, there would be little waiting for the formation of a coagulation circulation; there was one in existence already.

Then, how could blood stagnate in the aneurism as long as the common iliacs were open? It is impossible that blood should remain in an artery, unless it were made a close cavity by the stoppage of all apertures of exit. Even if the iliacs were stopped, though Dr. Murray denies the necessity of distal pressure where the aorta is concerned, would not the lumbar and spermatic arteries be big enough to take off in a second or two the few ounces of blood which the vessel contained below the site of proximal pressure?

Would not rather this take place? When the tourniquet was applied, the artery would collapse and approximate the sides of the aneurism lined with rough laminœ; as soon as a drop or two of blood found its way by the new channel into the sac, and in presence of these rough laminœ, it would be coagulated before it could escape, and so, by the time the communication between the superior and inferior mesenterics became large enough to supply anything like a steady full stream, the cavity would be almost filled, and the cure almost perfect.

It must be remembered that there is, over and above the elasticity of arteries impaired perhaps in the wall of an aneurism, a force tending to empty them exercised *á fronte*, namely, the peristaltic action of the smaller arteries, as shewn by MM.

* *Op. Cit.*, p. 30.

Legros and Onimus. Then, again, if an aneurism were cured by stagnation, it would remain the same size during the curative process. But in the last few hours of cure an aneurism enlarges. I felt, in the case above related, the sac "*fill out* and harden," and I think this is universal.

It has been suggested to employ a tourniquet on the distal side of the disease. Of this, Dr. Murray, in his "Concluding Remarks,"* says: "the value of his (Dr. O'Farrall's) suggestion is great, if the circulation be not completely stopped in all vessels which by anastomosis throw blood into the aneurism, but this seems to me impossible where the aorta itself is fully commanded."

Is it not *because* of the very free anastomoses which exist between the arteries of the abdomen that the cure of aneurisms of the aorta and its immediate branches can be accomplished so quickly? And if so, might not this be turned to account in treating aneurisms occurring at a greater distance from the aorta than the groin, as in Mr. Lawson's case quoted by Dr. Murray?† The collateral circulation would be speedily formed, but the aneurism would receive only a small quantity of blood, since the abdominal organs, supplied by vessels below the site of pressure and the opposite limb, would demand the larger share of that furnished by the new channel. This plan might be worth trial in a young, thin subject, in whom there was no objection to the giving of chloroform.

The distal tourniquet may be dispensed with where the coagulative power is normal, but where it is feeble, and especially in those cases in which pulsation recurs, it will be of considerable use. In such a case as the one related by Mr. Brookes, of Cheltenham, in the *Lancet*, vol. ii. for 1856, p. 192, it is difficult to see how cure could have been produced by pressure without two tourniquets. In it, an inguinal aneurism, pulsation returned on the day after ligation of the external iliac, and continued for *twenty-two days*. An effective collateral circulation must have been perfected here in about twenty-four hours; probably it had been partially made before the application of the ligature, for the aneurism was situate just under Poupart's ligament, which would exercise considerable

* *Op. Cit.* p. 41. † *Op. Cit.* p. 35.

constrictive force against its dilatation, and therefore obstruction to the passage of blood through its cavity.

It will be seen that I wish to establish the following propositions. I fear I may not have done so conclusively, nevertheless I would commend them to the consideration of every one who has aneurism to treat, as I believe they are true.

Firstly. "That cure by pressure takes place exactly,—*quoad* what occurs in the sac,—as in cure by ligature."

Secondly. "That it is, therefore, by the formation of a collateral channel *round* the site of pressure, as round the site of ligature."

Thirdly. "That it is not by stagnation of blood already existing in the sac, but by gradual increment of clot."

Fourthly. "That since in most cases it is impossible to keep up pressure on one spot sufficiently long to ensure consolidation, it is advisable to use the one artery method, by which cure is produced as quickly, and with far less distress to the patient."

I hope then to have contributed somewhat to the rendering of the pressure treatment, a definite treatment, as contrasted with what I believe to be the "chance" treatment, as advocated by Bellingham. At the same time, I cannot but think, in opposition to Dr. Murray, that the majority of aneurisms will take a longer time for cure than the few hours he speaks of so confidently.

For the more easy carrying out of the pressure treatment, I would submit the following recommendations, which refer specially to the lower limb, but which may be applied elsewhere.

The edge of the pubic ramus is the place where the crural artery is most easily compressed. In the case above related, as well as in others, I have found, by catching the artery with the finger diagonally against the edge of the pubis, it could be closed with less pain to the patient, and whilst the surgeon could keep up pressure in this fashion for considerable time, he could only do so perpendicularly to the bone for two or three minutes. The difference could be well estimated with the weight; it required for perpendicular pressure some two or three pounds more than for diagonal.

The groin ought to be well shaven and powdered very thickly; prepared fuller's earth is the best powder.

But of far more importance is the cooling of the weight. For another case, I would have the upper part of it deeply hollowed for the reception of a frigorific mixture. It was only by keeping the weights icy cold that we were able in the case above related to use them at all in the final act, for crops of pustules were appearing with most annoying rapidity, and the glands were enlarged and painful.

Finally, as there is under the use of complete pressure a reasonable prospect of quick cure, I would enjoin the free exhibition of opium or cannabis indica to dull sensibility, not necessarily to the extent of insensibility, but to prevent worry and fidgeting. Mental anxiety intensifies pain wonderfully. The patient whose case is the text of these remarks, after his mind was set at rest by the knowledge that his disease was cured, bore without a murmur for hours on a sore skin the weight which twelve hours previously he could scarce tolerate twenty minutes, and this too without opium.

ON THE USE OF THE PNEUMATIC ASPIRATOR.

BY C. E. LYSTER, M.D.

SURGEON TO THE TOXTETH PARK WORKHOUSE INFIRMARY.

It is always useful, on the introduction of any new instrumen tor appliance into practice, for those who have had some experience, however limited, in its use, to record the results. The narration of actual cases invariably encourages others to a trial of the means employed, or warns them from its use. I have been induced by this consideration to place before the readers of this journal a few brief notes of cases treated by means of the pneumatic aspirator.

In the *Lancet* for May 28th, 1870, the aspirator is figured and briefly described, and its invention is there attributed to Dr. George Dieulafoy, of Paris. In a subsequent number, however, that of June 11th, the origination is claimed by Dr. Protheroe Smith, of London, and, from the description and plate there given, it will be seen that the two instruments are undoubtedly identical in principle, though, I think, for practical purposes the one manufactured by Messrs. Weiss, and ascribed to Dieulafoy, will be found most efficient. The latter consists essentially of a graduated exhausting syringe, having two taps, with accurately fitting stop-cocks adapted to one end; to the distal extremities of the taps, exploring needles and canulæ of various sizes can be attached and removed at pleasure. The lower extremity of the piston rod is notched in such a manner as to permit of the piston, when drawn up, being fixed in its position by a half-turn. The mode of using the apparatus, which is sufficiently simple, is as follows: The stop-cocks connected with the taps are first turned, which effectually prevents the entrance of air into the interior of the glass cylinder, the piston is then gradually drawn out to its full length, and retained in its position by a half-turn, by this means an almost

perfect vacuum is obtained; the syringe is then laid aside, and the operator, having selected an exploring needle, or trochar and canula, as the case may be, carefully introduces it into the tissues to the necessary depth, the syringe is then attached, and the stopcock turned, when, if fluid be present, it immediately rushes into the cylinder. Should no fluid appear, the needle can be pushed deeper, or in a different direction, without detaching the aspirator; should the cylinder fill with fluid, it can be emptied either by removing it from the needle or canula altogether, or by opening the second tap, closing the first, and depressing the piston. When quite emptied, both taps can be closed, another aspiration made, and so on, as often as desired. In thus using the instrument, it is well to pay attention to one or two practical points. 1st. I now invariably induce local anæsthesia at the point of puncture by means of Richardson's apparatus. The pain is thus reduced to a minimum, and in some of my cases the patients have not complained of pain at all. 2nd. The needle or trochar should be well oiled before use, and some care is necessary for its proper introduction. The needle should not be pushed forward at once, but gradually insinuated into the tissues with a rotatory motion. 3rd. The state of the taps, stopcocks, piston, and needles should be carefully attended to, and every precaution taken to ensure their being in perfect order. The last may appear an unnecessary caution, but I am led to make it by a disappointment I myself experienced from inattention to the state of the exploring needle.

The following cases, illustrating the employment of the aspirator, are abbreviated from notes carefully taken for me by Drs. McGregor and Oxley, resident medical officers at the Toxteth Park Workhouse Infirmary.

John D., æt. 16, admitted to hospital March 15th, 1871, suffering from a severe attack of confluent smallpox, from which he was slowly recovering, when, on the 18th of April, he complained of acute pain at the left side, accompanied with much dyspnœa. The patient was so exhausted by the previous disease that it was found impossible to employ the usual remedies; and, beyond careful attention to diet, &c., the case was entirely left to nature.

April 28th.—Physical examination showed dullness over the

left chest, in front and behind; considerable displacement of the heart towards the right, breath sounds and vocal fremitus absent. It was at once decided to evacuate the fluid, and for that purpose I introduced No. 2 exploring needle in the usual position, and by means of the aspirator, drew off about 12oz. of pus.

April 29th.—Dyspnœa greatly relieved; able to lie on the right side; left lung more resonant on percussion; feeble respiration audible.

May 1st—5th.—Takes food better; gradually recovering.

May 6th.—Dulness and other signs of fluid still present, though in a much less marked degree. No. 3 trochar introduced, and about 6oz. of pus, slightly mixed with blood, withdrawn.

May 9th.—Complained of pain in the back; on examination discovered a superficial abscess.

May 10th.—Abscess opened and a quantity of fœtid pus evacuated, to the great relief of the patient.

May 15th.—Abscess discharging freely; able to take any amount of nourishment.

May 28th.—Abscess healed. On examination of the left chest the area of resonance was found greatly increased, though still some dulness remained at the base of the lung.

June 1st.—Continued improvement; discharged convalescent.

Case II.—Mary G., æt. 21, married, and nursing a child five months old, was admitted May 10th, 1871, states that three weeks before admission her husband struck her in the right chest, but as soon as the immediate effect of the blow passed off she experienced little inconvenience, and continued at work for a week afterwards, when she was suddenly attacked with severe pain and breathlessness, and was quite unable to leave her bed. She remained in this condition without any medical assistance for a fortnight, and was then sent to hospital.

On examination all the usual signs of pleuritic effusion were found to be present in an aggravated degree. The dulness anteriorly and posteriorly was complete; the decubitus was entirely on the affected side, and the dyspnœa very urgent.

May 11th.—No. 2 exploring needle introduced, and with so

much ease that the patient was scarcely aware of the proceeding. The aspirator was then affixed, and in the course of an hour 75oz. of yellowish-green serum evacuated. Ordered a large blister to be applied to the side, and diuretic pills and mixture.

May 13th.—Better; dulness still present at the back; respiratory murmur distinctly heard, breathing easy, and can lie without difficulty on the affected side.

May 14th.—Somewhat feverish; slight mercurial fœtor perceptible in the breath. Pills to be discontinued, and chlorate of potash added to former mixture. From this date the notes of the case show uninterrupted progress towards recovery. She was discharged perfectly well on the 29th of May, the physical signs indicating the complete recovery of the lung, and the absence of fluid in the cavity of the pleura.

Case III.—John H., æt. 41. This patient laboured under advanced phthisis of long standing, and had undergone the usual routine of treatment at various institutions. When admitted to hospital May 30th, 1871, he was suffering from a severe attack of phthisical pleurisy, and an examination showed the existence of a large collection of fluid in the right chest, complicated with disease of the left lung, and great general debility. The second sized trochar and canula were passed into the pleural cavity, and 50oz. of light-greenish coloured odourless pus withdrawn. The relief of the pain and dyspnœa was marked and immediate.

June 10.—Examination evidenced further accumulation of fluid. No. 1 trochar was introduced, and the enormous quantity of 175oz. of pus removed. The patient remained during the whole time occupied by the operation in the sitting posture, and complained of little or no inconvenience. From this date there was a slow, but marked improvement. All the symptoms were ameliorated, and he so far recovered as to be able to leave the hospital on the 26th June, and undertake a railway journey into Wales.

Case IV.—Sarah R., æt. 44, seven months pregnant, admitted July 21st. Dulness over left chest, back and front; vocal fremitus absent, heart somewhat displaced, decubitus entirely on affected

side, severe dyspnœa. No. 2 trochar used, and 30oz. of greenish pus withdrawn, the last few ounces slightly tinged with blood.

July 26th.—Canula again introduced, and about 10oz. of pus drawn off. The patient gradually improved, and insisted on taking her discharge August 16th, though advised to remain longer, as there was still evidence of the presence of fluid. I have made several efforts to trace further the history of this interesting case, but have been unable to ascertain any particulars.

Case V.—Jane M. passed through a severe attack of typhus fever under my care. During convalescence she suffered from a very common sequela, namely, abscess at the angle of the lower jaw, extending in front of the ear, and causing intense pain, inability to move the jaw, and deafness. I have always found abscess in this position most difficult of management, the depth of the matter from the surface, the strong covering of fascia, the proximity of the large vessels, and other important structures, rendering its evacuation by ordinary incision somewhat hazardous. In the present instance I at once plunged the trochar into the tissues, and having penetrated about one inch and a half from the surface, connected the aspirator, when pus immediately rose into the receiver. I succeeded in withdrawing about 3oz. The relief was marvellous; two days afterwards, at the patient's own request, I again used the instrument, and drew off 2oz. more of pus, after which the progress towards recovery was rapid and uninterrupted.

Case VI.—Mary P., æt. 36; after recovery from a sharp attack of smallpox, this patient complained of severe pain in the iliac region, and after some days fluctuation was distinctly felt, indicating the formation of a large diffused iliac abscess. The aspirator was used, and 10oz. of fluid withdrawn. Four days afterwards another puncture was made, and a small quantity of pus taken away, subsequent to which recovery went on satisfactorily, no further interference being required.

The cases I have narrated are sufficient to demonstrate that

operations hitherto of a somewhat formidable nature are reduced to comparatively minor proceedings by the use of the aspirator. The ease with which large quantities of fluid can be withdrawn from the chest through exploring needles of extreme minuteness is more especially shown in case No. 2. So convinced, indeed, am I of the entire harmlessness of the operation, that I should not hesitate in doubtful cases to satisfy myself as to the existence of fluid by an exploratory puncture, and this facility of penetrating the chest wall will prove, I feel certain, of inestimable service in the treatment of pleuritic effusion; for a considerable experience has taught me that the evacuation of the fluid in the very early stages by mechanical interference offers the surest means of attaining the great end in view—the complete recovery of the compressed lung.

The aspirator is eminently applicable to the treatment of pelvic abscess situated near the uterus, and necessitating puncture through the walls of the vagina; effusion of fluid into the larger joints and bursæ, and for tapping the bladder above the pubis in retention of urine. The latter operation is deprived of nearly all its dangers, and is reduced to a very simple proceeding by the employment of this instrument.

In conclusion, I have little doubt that in cases of chronic hydrocephalus the fluid may be gradually evacuated without any of the dangerous consequences which have hitherto almost invariably followed all mechanical efforts for the relief of this almost hopeless malady.

Note.—Since the above was written, an aspirator, invented by Dr. Vald. Rasmussero, and specially designed for thoracentesis, has been fully described by Dr. J. W. Moore, in the *Dublin Quarterly Journal of Medical Science* for August, 1871. Dr. Moore says — "The distinctive character of the instrument depends on the substitution of a two-water-way stop-cock for the two separate and single cocks in Dieulafoy's apparatus; but more especially on the insertion of a vent-piece of peculiar mechanism in the stead of either Dieulafoy's two ordinary stop-cocks, or the two-water-way cock."

It will be seen that this instrument differs from Dieulafoy's, inasmuch as the valve arrangement does away with the necessity of turning the ordinary stop-cocks off and on at each aspiration; but this advantage is, I think, more than counterbalanced by the somewhat complicated character of the mechanism, and its consequent liability to get out of order—indeed, Dr. Moore himself says that "small fibrinous clots may become attached to the valves and interfere with their action."

Dr. Moore does not appear to have tested the instrument, and, in the absence of any actual illustrations of its use, I continue to *prefer* Dieulafoy's apparatus, which, in my hands at least, has fully answered all practical purposes.

ON RELAPSING FEVER.

BY ISAIAH DE ZOUCHE, M.D.
ASSISTANT PHYSICIAN TO THE INFIRMARY FOR CHILDREN.

The recent, or still-present, epidemic of relapsing fever in Liverpool, has given ample opportunity for the observation of the principal features of that disease. As medical officer to one of the districts most heavily visited by the epidemic, about one thousand cases came under my care, and from notes of these the following paper is compiled.

I am able to trace the commencement of the epidemic in Liverpool to the early part of 1869, although it was not officially reported until November of the same year. It was observed by Dr. Hermann Weber in London, in September, 1868, when some Polish Jews, suffering from this disease, were admitted into the German Hospital*. The subsequent progress of the epidemic has been recorded in the various medical journals. It appears desirable that the principal features of epidemic diseases on each occasion of their appearance should be recorded, especially of those which occur at long intervals. The description of relapsing fever, as here given, refers exclusively to cases which came under my observation in the present epidemic in Liverpool. In the general description, the present tense is used for convenience. The following notes will illustrate the course of the disease in an ordinary favourable case.

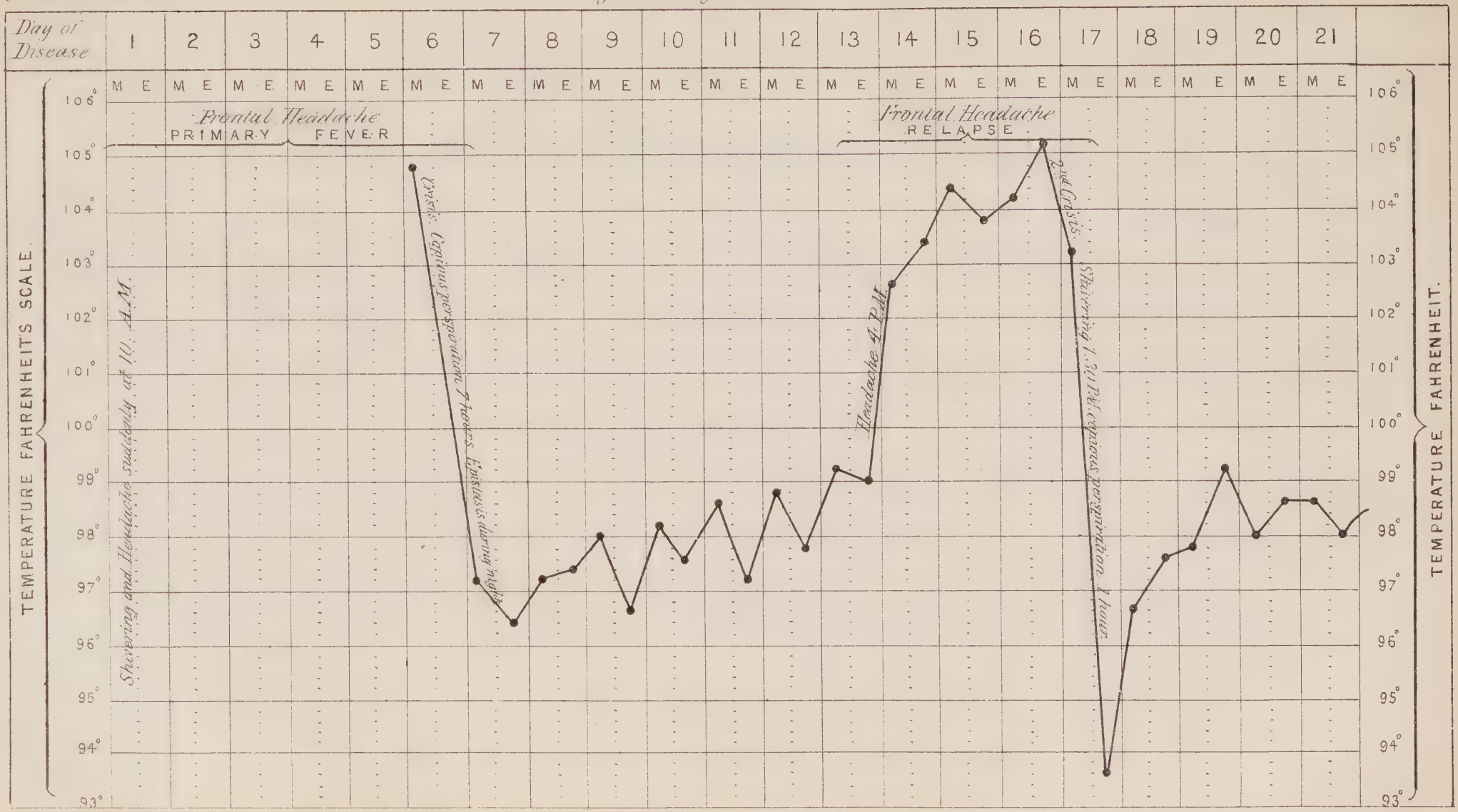
Alice B., aged thirteen years, came under observation on the 2nd November, 1870, the fifth day of the fever. On the 29th October she was perfectly well until six p.m., when she was *suddenly* seized with shivering, frontal headache, and vomiting.

5th day.—Frontal headache continues; she has pain in the epigastrium; is inclined to "ramble" in talk, but answers clearly

* *Lancet*, 13th February, 1869.

CLINICAL CHART OF TEMPERATURE IN RELAPSING FEVER.

Name W. K. *Age 12½ years.*



when spoken to. Face of a faint straw colour; conjunctivæ tinged yellow.

6th day.—*Crisis* occurred by very copious perspiration during the evening. Temperature 98·0°. No pain or uneasiness.

10th day.—Says she is very well, and wants to get up. No pain whatever; bowels constipated.

13th day.—Well in the morning; towards evening became sleepy; tongue dry in the centre. Temperature 102·3° at eleven p.m.

14th day.—*Relapse.* Sharp frontal headache and shivering at 12.30 a.m.

15th day.—Appears in great distress; moaning and complaining of her head; respiration sighing; pain on pressure over liver and spleen; bowels constipated for three days.

16th day.—Crying out with pain in the head; says she cannot sleep on account of pains *all over* the body; a little delirious; respiration 40.

17th day.—Temperature 104·3°. Face of a pale straw colour; has intense frontal headache. *Crisis.* During the day she was purged three times, and vomited. In the evening she said she was quite well, with the exception of pains in the hands; the tongue was clean and moist, and the respiration placid.

18th day.—Complains greatly of pains in the hands and feet; heart's action very slow, with a reduplication every four or five beats. Pulse 52.

22nd day.—All pain has disappeared; she was allowed to get up and convalesced favourably.

General description. In the majority of cases the bowels have been constipated for several days before any other symptom appears, and the tendency to constipation continues throughout the disease; but the first symptom which attracts attention is generally a rigor, a sudden sensation of cold and shivering "all over," and very great weakness. Frontal headache of a sharp neuralgic character sets in almost immediately, or in a few hours after the rigor. The shiverings continue at intervals, from half-an-hour to several hours. Vomiting and retching set in early; with some ceasing in a day or two, with others continuing until the crisis.

The matters vomited are yellowish, or greenish yellow, consisting of bile and the various secretions from the stomach. There is a loss of appetite, and very great thirst. The skin is pungent to the touch, the temperature attaining a height of 103 to 105 degrees on the sixth day. The temperature does not reach its climax until the moment of crisis. In addition to the headache, there is pain in the epigastrium and in the right or left side, or both. The liver and spleen are sometimes found enlarged, the spleen frequently so. Many patients complain of sore throat. The fauces, on examination, are found to be slightly reddened, and one or both tonsils are enlarged. In the febrile stages the cheeks are flushed, but the remainder of the face is pale, or rather of a straw colour; the conjunctiva has a faint yellow tinge. The appearance of the patient is peculiar, and in many instances quite characteristic. The eyes appear somewhat sunken, from the dark circle which surrounds them; they are clear, but have a despairing woe-begone look, not easily to be forgotten if once seen. The whole face expresses the consciousness of pain and helplessness. The tongue is red and glazed in the centre, yellowish-white outside the centre, with the red papillæ prominent, and red at the edges; a small portion of the extremity of the tongue remains red.

The headache and febrile symptoms continue for about six or six and a half days, increasing in intensity as the moment of crisis approaches.

Notwithstanding the high fever, delirium is not present as a rule. When the fever is at its height, the pulse attains a rapidity of 120 to 140 beats per minute. It is of very variable strength, in some cases of moderate fulness, in many it is extremely weak.

In the apyretic interval, I have frequently found it to intermit. During the first days of the fever the pulse may intermit in weak subjects. The action of the heart is feeble, the first sound being scarcely audible in severe cases. With the increase of the fever, that is just before the crisis, the pulse becomes considerably quickened, and ceases to intermit. As the crisis approaches, all the symptoms become intensified; the pains in the head and throughout the body increase; the respiration becomes very frequent, as much as thirty or forty in the minute, and the patient is

extremely restless. Friends become alarmed, and frequently send in haste for the medical attendant, under the belief that dissolution is impending. The patient complains of difficulty of breathing, "choking about the heart," and often insists on leaving his bed to get more air. The dyspnœa is out of all proportion to the abnormal amount of secretion which may be in the bronchial tubes. I have frequently examined the lungs at this stage, and seldom found disease present; sometimes the merest moist crepitation in the bases, rarely even that, unless the patient have had old lung disease. (The bronchorrhœa of relapsing fever occurs later.) It is purely nervous respiration. These exaggerated symptoms announce that the crisis is at hand, and it is at length ushered in by a rigor. Perspiration literally pours off the patient, the night dress and sheets being, as patients say, "wringing wet." It may continue from an hour to nine or ten hours, or even more. Sudamina are sometimes evolved on the chest. The temperature falls even two or three degrees below the normal standard. Crisis does not always occur by perspiration, however. The latter may be replaced by diarrhœa, the evacuations being of a watery character, or by vomiting. Hæmorrhages frequently occur at this stage, the most common being hæmorrhage from the nose, seldom to the extent of more than a few drachms; and in weak persons, and others suffering from severe forms of the disease, there is often a copious eruption of petechiæ. The petechial spots are small, except in very severe cases. They are evolved all over the body.

Miscarriage occurs invariably in the case of pregnant women; sometimes during the primary fever, more frequently during the relapse. The fœtus is usually dead.

Most frequently the crisis brings a sense of great relief, and the patient, when questioned, says he is quite well, with the exception of feeling weak. The appetite returns, and thirst ceases; the tongue becomes comparatively clean, and there may be no symptom whatever of distress until the relapse. Most patients get up, and some even try to follow their usual avocations.

In other cases, exudation of mucus into the bronchial tubes sets in about one day after the crisis, causing a distressing cough. The mucus is viscid and tenacious, producing a good deal of spasm in

coughing. Blood is frequently expectorated with the mucus, causing the affection to resemble whooping cough, especially in children. Severe pains in the limbs and joints occur, and about the second or third day after the crisis some of the latter may be found to be swollen. The metacarpal and phalangeal joints are especially liable to be attacked, but any joint may suffer. There are sharp muscular pains in the loins, in the calves of the legs, the thighs, the arms, the muscles of the neck, of the abdomen, &c. Scarcely any part of the body is exempt. Patients cry out with pain, and are unable to sleep, and at this stage the disease may be mistaken for acute rheumatism. If the patient's eyes are now examined, some congestion of the sclerotic will be found; the affection of the eyes, however, is usually more troublesome after the relapse. The pulse during the interval is remarkably slow, from fifty to sixty per minute in adults, and it intermits occasionally. The contraction of the ventricles is slow, and reduplication of the second sound occurs. An anæmic murmur is often heard at the base of the heart. Meanwhile the temperature is rising day by day, and a couple of hours before the rigor of relapse sets in, it has risen three or four degrees. Between the thirteenth and fourteenth days the rigor occurs, and the frontal headache and vomiting return. The relapse may be more or less severe than the primary attack. The yellowish hue of the face again appears, and the cheeks are flushed. The tongue, which had become clean, is again coated with a yellowish-white fur, the skin is pungent to the touch, and the patient complains of pains in the sides, in the epigastrium, and throughout the body. There is, in short, an exact repetition of the primary symptoms.

The temperature remains at a high point, between 104° and 105°, and gradually reaches its climax, when, on the seventeenth day from the commencement, and the fourth from the rigor of relapse, a second crisis occurs, much the same as the first. Perspiration again pours off the patient, petechial eruptions and critical hæmorrhages occur, sudamina appear, and the temperature falls below the average of health, and the patient appears convalescent. There is no essential difference between the course of the relapse and that of the primary fever, except perhaps that the

febrile period of the relapse, that is from the first rigor and headache until the crisis, is shorter by a day or two than in the first attack. The sequelæ, also, are much the same, and occur in the same order, namely, muscular pains, swelling of the joints, ophthalmia, bronchitis, &c., but these are more persistent after the relapse. There is every variety of convalescence; some get well apparently without any trouble, others have unmistakable reminders of the disease for weeks or months.

Notes on the principal symptoms and complications.

Mode of Attack.—Usually by rigor and headache. In several cases of children, however, the fever commenced (they "took it," as their mothers said) "with a heavy sleep," and slept the greater part of the day, showing evidence of pain in the head in the waking moments. The accession of the relapse was also marked by drowsiness. In a few instances there was diarrhœa, as well as vomiting for the first couple of days.

Suddenness of Invasion.—The following is an instance: A girl took a "note" to the workhouse for her mother, who was suffering from relapsing fever. On her way she herself was seized with shivering and headache, and with difficulty reached her destination. She was so ill on her arrival there that she begged to be admitted into the hospital, and was taken in at once. Patients can usually mention the very hour of the attack; thus they have told me they were "quite well until half-past six in the morning," or "seven o'clock in the evening," &c.

The Appetite.—In a few instances the appetite seemed unimpaired during the whole course of the disease, excepting for a few hours after the relapse, and preceding the crisis. The patients complained that they were being starved, and asked for meat.

Sore Throat was very common, frequently causing the disease to be mistaken for scarlatina, on a rough diagnosis.

Colour of the Skin.—In the great majority of cases it was more or less of a straw colour, becoming deeper and changing remarkably in shade as the crisis approached. In some the palms of the hands and the soles of the feet were of a well-marked light

saffron colour. Two cases had decided jaundice, with very great pain over the liver, and bile appearing in the urine.

Rash.—There was no constant rash observable, the petechiæ of crisis not coming under that head. In one undoubted case of relapsing fever there was an eruption something like that of rubeola over the body. In another, which I believe to have been relapsing fever, there was a rash indistinguishable from that of typhus. My notes of the case are as follows:—Mary M., aged twenty-two, shivered and vomited on 7th September, 1870. On the 11th she felt better, and was able to get up and sit at the hall door. In the evening she went to bed, and remained there until the 14th, when she had a copious perspiration, and slimy evacuations from the bowels. On the 16th she went to hospital, and I lost sight of her. There was a small mulberry rash exactly like that of typhus, and a few petechiæ over the body. The tongue was brown and moist; she had a cough, and expectorated thick phlegm with a little blood. Her mind was perfectly clear, and there had been no delirium. In three instances I noticed a scarlet efflorescence exactly resembling that of scarlatina. The occurrence of this rash, together with sore throat, might cause the disease to be mistaken for scarlatina, a mistake which I have known to occur several times. Dr. Robertson, who had charge of the Ashfield Street fever sheds, also noticed a similar rash.

The Tongue.—In a great many patients the tongue was tranversely fissured, especially if the symptoms were at all severe. In those assuming a typhoid character, patches of ulceration frequently occurred on the tongue and cheeks; sometimes there were deep brownish-yellow incrustations, resembling a fungoid growth.

The Heart and Pulse.—Dr. Murchison says that "the diminished impulse, impairment, or absence of the first sound so common in typhus, does not occur in relapsing fever." My experience does not agree with this, especially in cases which were at all more severe than usual. In these I found the impulse so much lessened, that the first sound resembled a faint muscular murmur, heard with difficulty, or quite inaudible. The weakness of the first sound occurred in so many cases as to attract my particular attention to this symptom, and also the irregularity of

the heart's action, a number of quick contractions being followed by a number of slow ones, or after a variable number of beats, a short quick sound, or reduplication took place. The intermission of the pulse ceased altogether after the second crisis. The pulse, like the temperature and respiration, was higher in the morning than in the evening.

Hæmorrhages.—Epistaxis was very common. I have also seen instances of critical hæmorrhages from the bowels, from the uterus, from the stomach, and from the lungs, in the above-mentioned order as regards frequency. In women who were at the menstrual period, the flow was increased; in those past the menstruating age it took the form of a regular uterine hæmorrhage, a dangerous, but fortunately not a frequent complication. One district patient, who was suffering from a second relapse, told me she had had a discharge from the ears when in hospital, where she had been sent in the first instance.

The Petechiæ remain for five or six days, and are persistent after death, if death occur at this period. In infants, old people, and severe cases, they were seldom absent at the critical stage, sometimes limited to a few spots about the chest, sometimes copiously dispersed over the body.

Odour of the Body.—I noticed a peculiar sickly smell from the body, but less marked than that of typhus, and differing from it.

Delirium occurred in a few cases. In some it was the result of excessive pain apparently; in others it appeared to be caused by the overwhelming nature of the fever poison, as occurs in other fevers. These cases resembled delirium from drink; and in a third set of patients it resulted from exhaustion.

Crisis by perspiration is the most favourable. Crisis by purging and vomiting is dangerous, on account of the exhaustion which is liable to be induced.

The Interval.—The temporary state of ease conferred by the crisis is in remarkable contrast to the previous suffering, and to the relapse which is to follow. One patient, a woman, whose case resembled typhus, such was her prostration in the primary fever, was out chopping wood when I visited her three days afterwards.

Such patients believe they will have no relapse, and laugh at the physician's supposed mistake. Hospital patients often insist on being discharged, and they are not a little surprised when the relapse occurs.

Variations in the course of Relapsing Fever.

The Relapse.—The relapse may be delayed beyond the usual time. In one case it did not occur until the thirty-third day from the primary attack; in another not until the thirty-ninth day. I have noticed instances of two and three genuine relapses. Second and third relapses must not be confounded with distinct new attacks. Many of the patients discharged from hospital were again attacked with relapsing fever several weeks afterwards. This I attributed to their returning to the fever atmosphere of their own homes, where fresh cases were continually occurring, and such weakened subjects appeared very susceptible to the contagion.

The Crisis.—There are also variations in the time of crisis. In two cases particularly observed, a partial relapse took place on the fifteenth day, followed in a few hours by an imperfect crisis (in one by epistaxis, in the other by perspiration), with some relief to the headache. On the sixteenth, seventeenth, and eighteenth days, however, the febrile symptoms continued, attaining their greatest intensity on the nineteenth day, and followed by a full crisis by profuse perspiration. The second crisis occasionally takes place in a different manner from the first; thus the first may be by perspiration, and the second by purging and vomiting. This is not common, however.

We have the authority of Dr. Murchison for saying that the relapse does not occur in every instance. In all the cases which have come under my observation, however, I have been able to ascertain that it did take place. It might be later than usual, or so slightly marked as not to prevent the patients from working, but on questioning them closely, I found that on a certain day they had a slight shivering or headache, or had been unable to eat their food, or experienced some feeling of malaise. In a few cases the fever of relapse was composed of a series of exacerbations and remissions, the patient having a rigor every day at a

certain hour, and some perspiration, with relief to the headache; and this went on until the crisis.

Sequelæ of Relapsing Fever.

Swelling of the Joints usually subsided in a few days, but occasionally assumed the character of chronic rheumatism; the hands and wrists were usually affected, more rarely the knee and ankle joints.

Muscular Pains very often remained for weeks, especially across the loins and in the legs.

Bronchitis.—This appeared to be the result of passive, but copious, exudation into the bronchial tubes without evidence of active inflammation of the mucous membrane, so that the term bronchorrhæa would be more accurate. The resemblance to whooping-cough in children was very striking. In a few cases moist crepitation could be heard at the bases of the lungs, and rough sounds in the larger tubes, but no sibilant râles.

Ophthalmia.—In most instances this appeared limited to simple vascularity of the sclerotic on superficial examination, and soon disappeared. In some, the appearance of the eye was the same as that which was formerly described as rheumatic ophthalmia, the pink congested vessels of the sclerotic running towards the cornea. There was pain in the eyeball, intolerance of light, and increased lachrymation. In one case, the cornea was burst from the pressure of fluid effused within the globe of the eye. In another, there was ulceration of the cornea in both eyes. The amaurotic symptoms were more noticeable after the second crisis. A few patients complained of it for several months.

Anasarca was a very frequent consequence; the feet and legs being affected, and the thighs and scrotum occasionally, but rarely. It was very amenable to treatment. The dropsical effusions came on rather suddenly, usually after the second crisis, and subsided in a few days, or a couple of weeks.

Parotitis.—The parotid and lymphatic glands of the neck were swollen in some instances. In two patients there was decided inflammation of the parotid, proceeding to abscess in one case.

Deafness occurred in three cases, in one of which the hearing

has remained impaired for several months, although gradually improving.

Epistaxis sometimes occurred at an uncertain period after the second crisis.

Desquamation of the Cuticle in small fine scales occurred in many cases about the second week after the crisis.

The Hair also fell off in several instances.

The Prognosis

in relapsing fever is favourable as a rule. The average low mortality may, however, lead the physician to overlook the tendency to death in individual instances, and when the symptoms are at all more striking than usual, the prognosis should be guarded. In the fatal cases which I observed, the unfavourable symptoms were jaundice, profuse uterine hæmorrhage, large petechiæ or purpuric spots, sordes and ulcerations about the tongue and mouth, incomplete defervescence after the first crisis, a state of extreme restlessness, and nervous exaltation after the second crisis, delirium, combined with an extremely weak and rapid pulse, and inaudible first sound of the heart; a low state of debility, or marasmus, a kind of hectic, sometimes proved fatal at the end of several weeks amongst very poor, badly fed patients.

Modes of Death.

In fatal cases death may occur by syncope, especially at the time of crisis, from nervous exhaustion (evidenced by sleeplessness and "spinal" respiration); from excessive diarrhœa, probably also from effusion of serum into the ventricles of the brain (see case of Richard D.); in women, from uterine hæmorrhage, or from the exhaustion of premature labour and hæmorrhage combined; in children, from the exhaustion of vomiting; and in infants, from inability to take the breast. In one fatal case the patient, a child aged six years, became suddenly comatose during what seemed a favourable convalescence. In chronic cases death occurs by a process of exhaustion. I have only seen one instance in which I could attribute death to uræmia.

With the best of care a certain number of deaths will doubtless occur, *but a fatal termination is exceptional in relapsing fever.* A great many of the deaths I have seen, resulted directly or indirectly from want of proper nourishment during the fever or afterwards, or from previous exhaustion.

Post Mortem Appearances.

Owing to the small mortality of relapsing fever, and the difficulty of obtaining permission to make *post mortem* examinations, I have only been able to make autopsies in three cases; in two of these there were no very distinctive appearances. The third was that of a man who died on the seventh day of the fever; this would correspond to the period of crisis. The examination was made hastily, and under great difficulties.

Richard D., aged forty-five years.

The Skin showed a copious petechial eruption.

Brain.—Arachnoid raised up by fluid effusion underneath. On puncturing it a quantity of serum escaped. At the longitudinal sinus, somewhat posteriorly, the arachnoid seemed opaque. The surface of the brain was very pale, and a section showed a pale appearance. The ventricles were full of serum. The total amount of serum in the ventricles, and under the arachnoid, was about eight ounces. The bloodless appearance of the brain was remarkable.

Lungs.—A few old tubercles in the apex of right lung. Lungs crepitated throughout; some hypostatic congestion.

Heart.—No serum in pericardium; black soft blood-clot in right auricle, and continued into the ventricle. Some decolorised fibrine in left ventricle, extending into the aorta.

Liver.—Somewhat enlarged. No blood exuded on section. The organ appeared healthy to the naked eye.

Gall-bladder full of bile.

Spleen, about three times the normal size; portions of the surface were of a lighter colour than the rest, and gave way under slight pressure. Under this soft exterior were cavities which would admit the top of the index finger. The walls of these cavities were soft and broken down, not unlike the interior of an abscess, only

that there was no positive pus. The remaining substance of the spleen was tolerably firm.

KIDNEYS.—Both enlarged. Section showed fatty degeneration.

STOMACH and INTESTINES not examined.

Causes.

The state of the sewers, and the nature of the material used for house foundations, have recently been the subject of investigation by Dr. Stallard, and by Drs. Parkes and Sanderson. From their reports it would appear that the sewers are extremely defective, many of them containing copious deposits, and that the materials of which the foundations are composed are, in many cases, capable of generating noxious gases, which may enter the houses. The influence of these conditions in the production of fevers can be easily appreciated. To these should be added poverty, overcrowding, and filth, faulty construction of houses, and the great court system. The poor of Liverpool may be said to be in a state of chronic debility from various causes, which usually appears in the returns under the general term of "bronchitis." They are thus at all times an easy prey to any epidemic which may be prevalent. Their food is, for the most part, bread and tea, the latter of very doubtful quality, and occasionally a little fish. The tea is taken as a stimulant, replacing equally cheap, and more nutritious articles of diet. Dyspepsia and constipation are the result of this system of living. I cannot but regard the general use of tea by the lower classes as a great evil. Children suffer especially from the defective quality of the food, as the number of ricketty and strumous children brought to our hospitals and dispensaries testifies. In addition to the stimulant tea, should be added the stimulant, or rather depressant, alcohol, which unfortunately plays a large part in the production of the chronic debility of the poor.

In a great many of the houses the access to the upper rooms is through the room on the ground floor. The staircase acts as a shaft for the communication of the air in the lower room with those above. Should there be fever in this apartment, it will almost inevitably spread to the families living upstairs. In some houses

beds are made in a closet under the stairs, or in a kind of locker in the wall. In others the family bed is in a recess, effectually shielded from any stray draft which might reach it from a window habitually kept closed. The courts are a blot on the town. If in their construction it was intended to exclude light and air, and favour uncleanly habits, that end could hardly have been more fully attained than it has been in Liverpool. Many of the courts are built up at one end; into many direct sunlight never penetrates. Drs. Parkes and Sanderson state, with regard to the courts, that "few constructions could be better adapted to the spread of contagious diseases."

If relapsing fever can be generated *de novo*, as Dr. Murchison believes, the conditions for its origin in this way appear to exist in Liverpool in a constant quantity.

Pathology.

It appears evident that there is received into the system a poison which, after a variable period of incubation, gives rise to the symptoms already enumerated. The poison is multiplied in the bodies of those affected, and is propagated by infection and contagion.

Infectiousness.—It is the most infectious of all fevers with which I am acquainted, with the exception perhaps of small-pox. Amongst the poor the rule has been that it has attacked in succession *every* inhabitant of a house in which it has once gained a footing. As many as sixteen cases have occurred in one house. The poison holds tenaciously to the house, endangering those who may inhabit it for months afterwards.

Pathology of the Symptoms.—The poison of relapsing fever appears to have a specific action on the nervous system, and the stages of the disease might be mapped out by the nervous phenomena. There is (1.) General nervous excitement culminating at the crisis; (2.) Depression of the nervous system, which tends to return to its normal condition, but gradually rises beyond this; (3.) A state of excitement which again reaches its climax by a crisis; (4.) Depression, the normal condition being gradually resumed.

In the first instance the action of the poison on the nervous system is evidenced by the sharp frontal headache and occasional delirium, and pains throughout the body. I am not disposed to think that the primary headache is the result of cerebral congestion. There is, it is true, flushing of the cheeks, but the remainder of the face is pale, and the eyes are not congested. The congestive affection of the eyes occurs at a later date, when the joints and muscles are the seat of pain. I think it very probable, however, that congestion of the cerebral vessels may occur as the fever progresses, especially near the crisis. The hurried and difficult respiration before the crisis, would seem to be the effect of the fever-poison on the nerves of respiration, for at the stage at which it occurs the lungs are not diseased as a rule. The peculiar action of the heart, and intermittency of the pulse, will also admit of explanation by a similar theory.*

The crisis is, doubtless, an effort of Nature to eliminate the fever-poison. Why the first crisis is insufficient it is difficult to answer. It may be that the blood undergoes some further change or "zymosis" after the first crisis, requiring a second fever to restore it to its healthy condition. It may be that Nature kindly divides an exhausting disease into two periods, giving the patient an interval of rest, in order to husband his strength, and enable him to undergo by two efforts a severe crisis, which could not be accomplished at once without danger.†

The coloration of the skin and perspiration of crisis may be called an acute form of chromidrosis, but like that affection, its pathology is obscure. It is most intense just before the crisis, in many cases being hardly observable when the perspiration has ceased.

* This, it will be remembered, occurs most frequently during the apyretic interval, or period of depression. Dr. B. W. Richardson considers intermittency of the heart to depend on depression of the nervous system, the result of mental excitement. (*Discourses on Practical Physic*, p. 49.) There is certainly much mental excitement before the crisis, the patient being often in terror from the severity of the symptoms.

† Dr. Hudson accounts for the relapse as follows:—"In my report of the epidemic of 1847-8, I mentioned that in every case in which I observed the persistence of splenic congestion and enlargement after crisis, relapse followed. The cause of relapse I believe to have been the gradual commingling with the circulating mass, of a large quantity of blood, which, lying by, so to speak, in the congested organ, did not share in the depuration of the mass during crisis." "*On the Study of Fever*," p. 175.

The bronchorrhœa, swelling of the joints, œdema of the feet, and muscular pains, are due, I believe, to local exudations of the watery parts of the blood, containing a portion of the fever-poison which did not escape at the time of crisis. These exudations, it will be remembered, *follow* the crisis, being, in fact, a continuation of that process, occurring in an abnormal manner; and they are more or less severe in their effects, according to the incompleteness or completeness of the crisis proper. In this way the occurrence of effusion of serum into the ventricles of the brain at the time of crisis (case Richard D.), would be explained. The tendency to the exudation of the serum of the blood may, perhaps, cause some forms of ophthalmia met with after relapsing fever. In one case, before referred to, the increased aqueous humor burst through the cornea.

The Urine.—Owing to the great pressure of work, I was unable to make any satisfactory observations on the urine, and very much regret this deficiency in my paper. I examined the urine frequently for albumen, however, but only found it present for a few days in one case. In the urine of patients suffering from œdema of the feet, I found under the microscope crystals of oxalate of lime, uric acid, and urates, but no tube casts.*

The temperature follows the course to be expected from the nature of the disease; high during the febrile stages, and low or normal in the intervals. The very low temperature after crisis by perspiration is to be accounted for by the great evaporation from the skin. In three cases observed, I found the temperature in the morning higher than in the evening. This is a phenomenon which I am at a loss to explain, the rule being in fevers that the evening temperature is the higher.

The Excreta.—The evacuations, whether procured by medicine or occurring naturally, are not unhealthy; they are sometimes a little darker than normal.

Diagnosis.

In seeking for the alliances of relapsing fever, just as we look

* See, however, note p. 102.

for the nearest allies of a natural order of plants, I am disposed to place it next to the scarlatina class of diseases, especially those forms associated with acute rheumatism. The points of resemblance are briefly these: sore throat, swelling of the joints, œdema of the feet, and desquamation of the cuticle. The resemblance is very marked in those instances in which a rash appears.* The crisis by sweating, diarrhœa, or epistaxis, which sometimes occurs in rubeola, would bring relapsing fever into connection with that disease; while the occurrence of the remission would show an approach to dengue.

The diagnosis has to be made from simple continued fever, scarlatina, rubeola, typhus, typhoid, bronchitis, rheumatism, jaundice, purpura, intermittent fever, and alcoholism. It is hardly necessary to point out the distinctions. Relapsing fever has often been confounded with typhus, or considered identical with it. I have seen a man lying ill with typhus, while his wife beside him was suffering from relapsing fever. Nor has it any protective power against typhus. Two patients (sisters) who were under my care for relapsing fever in July, 1870, were treated by me for typhus in July, 1871.

Treatment.

The patient should be kept in bed until the second crisis has passed, although it is not easy to enforce this direction. The sequelæ are more severe if the patient get up and move about in the interval. The disease is, I believe, quite uninfluenced in its *course* by medicines; but relief is experienced from aperients, anodynes, and remedies to allay the distress caused by vomiting. Purgatives are required from time to time. Castor oil seemed to me the most useful. The vomiting, doubtless, answers some salutary indication; it probably serves to unload the congested vessels of the spleen and liver. I have, therefore, not been in the habit of checking it, but merely of moderating it if excessive. My practice has been to give lime-water with milk, which I found beneficial. Small pieces of ice sucked occasionally are also useful

* Dr. Hermann Weber found renal tube casts in one of his cases.—*Lancet*, February 13th, 1869.

as well as agreeable to the patient. Effervescing salines are grateful to the patient, and useful as diuretics. The latter seemed to be indicated on account of the tendency to the accumulation of urea in the blood.* The pain and sleeplessness should be relieved by an opiate. This is very important where there is any danger of nervous exhaustion. I have found the hydrate of chloral very valuable. Bronchitis should be treated on general principles. The food should be light and nutritious during the whole course of the disease, and should consist of milk, beef-tea, corn-flour, &c. Patients usually crave for meat and their ordinary diet after the first crisis, but this I consider to be injurious. Stimulants are not required as a rule, but should be given when the symptoms indicate debility. Old people will usually require wine or brandy, and infants, who are unable to take the breast, may require a little wine until the crisis is past. The rheumatic affections of the joints and muscles following relapsing fever are best treated by diuretics, tonics, and liberal diet. Post febrile ophthalmia in this epidemic seldom required active treatment. In a few cases I found it necessary to leech the temples, apply a succession of blisters, and give iodide of potassium with bitter tonics. The results were favourable. To prevent, if possible, the relapse, I have only tried quinine in doses of five grains three times daily during the interval. I tried it in three instances, and in all curiously enough the relapse was late in its occurrence. In one it occurred on the seventeenth or eighteenth day; in another on the thirty-ninth. But I have seen the relapse delayed where no medicine whatever was given.

* See "*Murchison on Fever.*"

TABULAR REPORT OF THIRTEEN CASES OF TRANSFUSION OF BLOOD; WITH DIAGRAM OF THE OPERATOR'S INSTRUMENT, AND OBSERVATIONS.

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If "forewarned-forearmed" is in any case to be the motto of a medical man, assuredly it should be so with respect to the operation of transfusion. The mind needs to be made up beforehand as to its propriety, and the mode of operating; and instruments, simple or special, must be easily procurable, or the chance for the patient may have fled ere the operation can be performed.

In the hope of contributing his share to this desirable object, the writer condenses and tabulates the results of his experience since 1848. Cases I. and X. were his own patients, the other eleven cases were under well-established practitioners, who called him in to operate, and lent their aid. The first seven cases will be found more at length in the *Liverpool Medico-Chirurgical Journal*, January, 1857, but have not, to the author's knowledge, been gathered into the reports of any compilers on this subject.

TABLE OF THIRTEEN CASES IN WHICH TRANSFUSION (WITH PURE BLOOD) WAS USED BY MR. A. HIGGINSON, SURGEON.

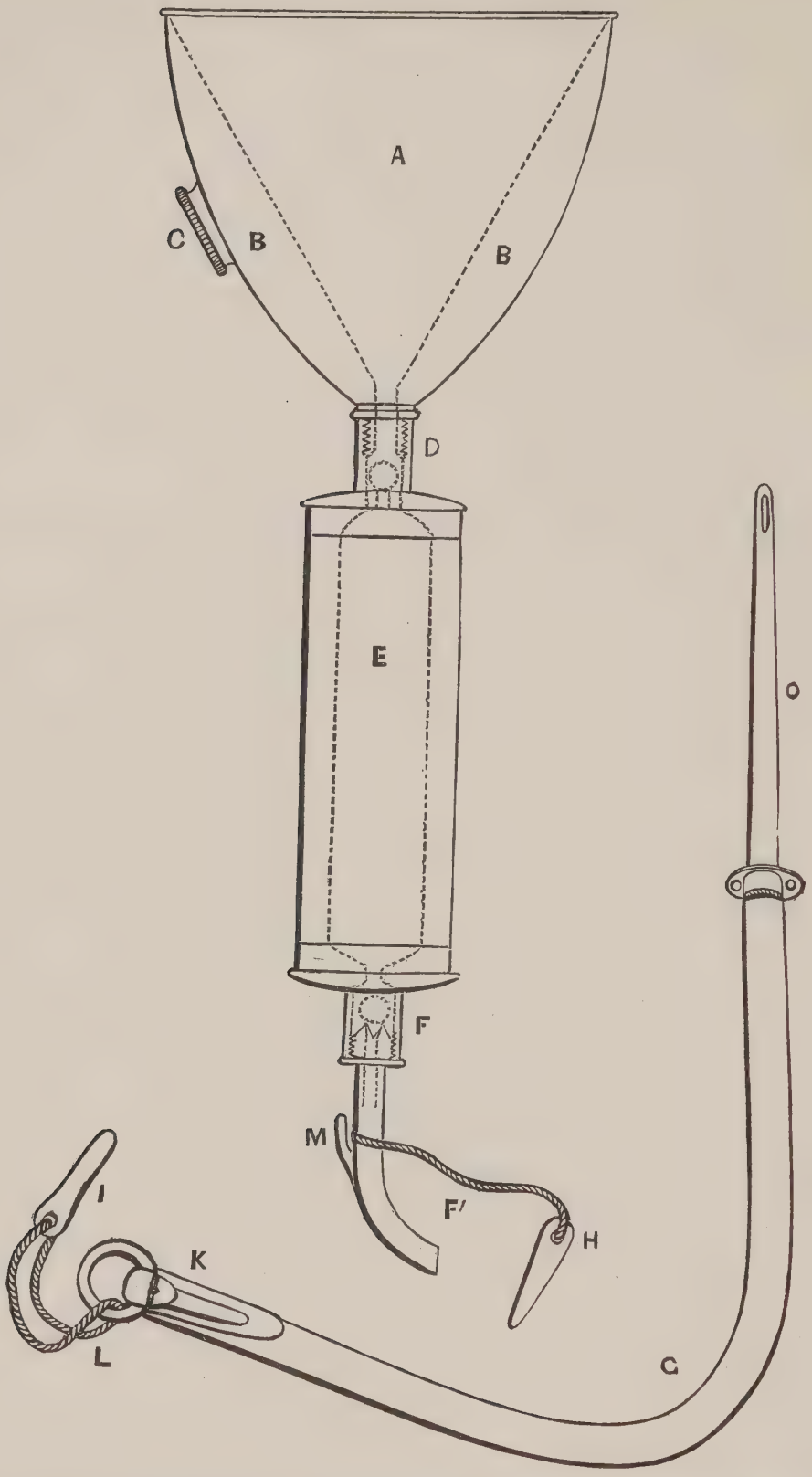
NO.	DATE, ETC.	CASE.	BLOOD INJECTED.	RESULT.
I.	Mar. 12, 1848. Mrs. C., æt. 33.	Extreme prostration from suckling twins. Confined of twins; fourth labour, July 7th, 1847, having had dropsy for three months previous. Suckled both children till March, 1848, and became exhausted thereby. Had diarrhœa, vomiting, faintings, and appeared near dying. Transfused, with improvement of pulse, and apparent sleep. A rigour succeeded, then reaction and excitement, with delirious singing. Slept, and took food; went into the country ten days afterwards, and had no relapse. Died three years afterwards of phthisis, of six months duration.	12 oz. From female servant.	Successful.

NO.	DATE, ETC.	CASE.	BLOOD INJECTED.	RESULT.
II.	Dec. 7, 1850. Mrs. R., mother of several children.	Hæmorrhage after birth of child, on expulsion of placenta. Funis very short. One large gush of blood prostrated the lady. Her sister supplied the blood. Recovery was speedy and striking.	10 to 12 oz. From sister.	Successful.
III.	Feb. 7, 1851. Mrs. T. mother of a large family.	Hæmorrhage from Placenta Prævia; sudden and exhausting: placenta removed when I was called to transfuse. Patient much sunk and livid. Extreme restlessness. No amendment from operation, which was cut short by the pipe being jerked out of the arm. She died immediately undelivered.	8 oz. From female servant.	Unsuccessful.
IV.	Sept. 12, 1851. Elizabeth E., æt. 37.	Hæmorrhage from partly-adherent placenta. Uterus emptied; no more bleeding. Sixth labour: at Liverpool Lying-in Hospital. Patient gradually sunk seven days after transfusion. P.M.: Uterus internally purulent and offensive. Other viscera anæmic, free from disease; veins healthy.	12 oz. From female servant.	Recovered, and lived for seven days.
V.	Ladies'Charity case; in very low life.	Partial Placenta Prævia. Sinking. Not delivered. Supply bad; operation did little good; 12 ounces of salt and water injected, with some improvement. Delivery. Death.	5 or 6 oz. Two females; very poor.	Unsuccessful.
VI.	Nov. 10, 1856. T. C., æt. 21, at Workhouse.	Mania. Loose character and attempted suicide. Had refused food for a fortnight, and, in spite of enemata and stomach-pump was sinking. No pulse in radial arteries, 130 in brachial. Resp. 26; therm. 94° in axilla. Unconscious; offensive sputa; expression painful; eyes turned up, lids closed, and with dark marginal ring. Transfusion easily performed, with varing improvement of pulse, breathing and countenance. Swallowed after a few hours, and put out her tongue; relapsed and died during the second night. P.M.: Serum effused on surface of brain, arachnoid opaque; brain firm, vessels of pia mater somewhat full. Left lung adhered at upper lobe, and, when torn away, offensive pus escaped from small cavities. Both lungs dense with congestion and œdema; no tubercles. Heart contained fluid dark blood.	20 oz. Female.	Doubtful benefit. Lived 40 hours.
VII.	Nov. 25, 1856. Mrs. J., æt. 36, mother of several children.	Placenta Prævia, with hæmorrhage; delivery and subsequent draining. Transfusion, and rally of the patient. Return of flooding. Death in 3 hours.	12 oz. From a female friend.	Improved, lived three hours. Fatal hœmorrhage returned.

NO.	DATE, ETC.	CASE.	BLOOD INJECTED.	RESULT.
VIII.	May 25, 1859.	A lady, in her first confinement, had post partum hæmorrhage, some miles away from Liverpool. Some hours passed without rally before transfusion could be had recourse to. A fair amount was injected; but death took place almost immediately.	7 oz.? Female servant.	Unsuccessful.
IX.	April 19, 1860.	Abortion (? 5½ months), completed, with much loss and draining. Lady much sunk; blanched, sick and restless. Responded at once to the transfusion, and made a good recovery.	8 oz. Female servant.	Successful.
X.	June 18, 1860.	J. C., æt. 51, hospital patient. Hæmorrhage from fore-arm, after phlegmonous erysipelas. Brachial artery tied immediately. Patient sinking; no more bleeding. Rallied on transfusion; arm amputated two days after, and the man made a good recovery. He is now living and well. The daughter-in-law died, after two years, in phthisis.	10 oz. (about) From his son's wife.	Successful.
XI.	Oct. 30, 1862.	Case of Fallopian fœtation, diagnosed as ruptured into the peritoneal cavity, and the patient sinking from concealed hæmorrhage. Vein opened very obscure. A large thrombus resulted from the injection, and too little entered the system to do any good.	? 4 oz. From the husband.	Unsuccessful.
XII.	Oct. 10, 1863.	Post partum hæmorrhage. No improvement took place from remedies while waiting for a subject to supply the blood. Operation speedily effectual. The lady made a good recovery	? 6 oz. From a labourer's wife.	Successful.
XIII.	June 4, 1871.	A lady, in her eighth confinement, commenced her labour at full time, with *severe* pain in the hypogastrium, and much tension of the abdomen. The os uteri was dilated by the finger, and liquor amnii discharged, with relief to the pain, and the labour was expedited as much as possible. Twins were born; the first dead and decomposing, the second living. With the placentæ, one of which had evidently been detached a considerable time, a large amount of clot was expelled, and sinking occurred. Tinct. ferri diluted, applied to the uterus. Several hours passed without rally, and transfusion at once restored her to safety. She recovered well, and bore a long journey a month later.	8 oz. (nearly.) From female servant.	Successful.

Of these thirteen cases, one was surgical, and did well (Case X.); two were medical; Case I. eminently successful, Case VI. lived forty hours, and was not likely to benefit more permanently by the operation; ten cases were obstetric, including XI. (fallopian fœtation case); four of the ten were unsuccessful, and six successful. Of the four unsuccessful, two were transfused while undelivered, another was the fallopian case, and one in the country. The six successful obstetric cases were absolutely satisfactory in immediate effect. In all of these thirteen cases blood fresh from the arm, without manipulation or admixture, was employed, the largest quantity injected being 20oz., and the smallest 4oz.; average of all the cases about 9oz. From the female subject in all, except in Case XI., in which instance the supply was from the husband. The *quantity* of blood injected is known to be closely approximate, though not exactly measured. The instrument used is a special one, essentially a "Higginson's Syringe" reversed, and a funnel added to receive the blood. A diagram and description of it is appended. The objects aimed at in its construction are to avoid injection of air, to keep the blood at an even temperature, and always moving onwards. An average of 9oz. in each case before coagulation occurred shows a sufficient capability of practical utility with pure blood. Still, the experiments with defibrinised blood, or with solutions added to it, may be ultimately of value in practice.

The accompanying diagram almost explains itself. To use it, immerse it for a few moments in a large basin of warm water at 100°, remove the screw C till the cavity B is full of water, then close the opening again. Fill the elastic tube G with water, and close the opening K with the plug I; handle the tube gently, and keep it horizontal while inserting the terminal pipe O into the patient's vein. Bleed the supply into the cup A, and temporarily place the plug H in the pipe F; holding the elastic barrel E in a light grasp of hand, expel the air, and draw in the blood through D. When this is done, and the cup nearly full of blood, the plug H has to be removed, also plug I, and the pipe F inserted into the opening K. M is a small stud to receive the ring L, and make the coupling secure. At first the blood may flow freely, by



MR. HIGGINSON'S TRANSFUSION INSTRUMENT.

(*Diagram, half the actual size.*)

A, metal cup (6 oz.) to receive blood. C, opening to admit warm water (5 oz.) to the space B. E, elastic barrel to receive blood from D, and expel it through F. Ball-valves allow it to pass only in the onward direction. G, elastic tube, with metal pipe O, for the vein, and mode of junction at K, with the apparatus.

gravitation only, into the patient's vein, but soon a little impulse is required by pressure on the barrel of the instrument. The ball-valve at D is not thrown upward by air escaping from the barrel, but rises with the blood, and prevents its escape into the cup. Nevertheless, it is not advisable to let the blood sink so low in the cup as to draw air into the barrel. The lower ball at F might, perhaps, be left out altogether, the more particularly as coagulation is apt to begin at that part. The whole instrument unscrews for cleaning, and the ball valves must be looked for in the coagulated blood.

Should the operation be impeded by coagulation before a sufficient quantity of blood has been received by the patient, it is easy to supplement it sometimes with a syringe and teacup, if the supply is still good, and a syringe ready, the nozzle, when perfectly full, being carefully inserted at K.

It is well that the operator should have two competent assistants, one to restrain the patient's arm, and keep the pipe secure, the other to keep a good supply of blood flowing into the cup, while the operator looks to its passage through the instrument. It facilitates the placing of the pipe in the vein, to put a probe or a large pin underneath it before opening the vessel, which may often be so small and contracted as to endanger its transfixion, and the passage of the pipe into the cellular membrane beneath.

In conclusion, it is the writer's strong hope that competent operators will take up this important operation, study the best modes of performing it, and ever hold themselves in readiness for the duty of saving life by its means, when called to rich or poor.

NOTES OF A CASE OF POISONING BY CARBOLIC ACID.

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Emily L., æt. 16 years, servant. On Monday, August 28th, 1871, about 6.30 a.m., owing to some quarrel with her lover, swallowed, with the intention of committing suicide, fifteen drachms of Calvert's No. 5 solution of carbolic acid.* She tried two or three times (about five minutes after having taken the poison) to ascend a ladder leading to her bedroom; at last she succeeded, and upon reaching her bedroom she walked across a landing to her master's bedroom, where she appeared about ten minutes to seven (twenty minutes after having taken the poison). She seemed wild, and partly unconscious, as though she had taken a large quantity of alcohol. She sat on the edge of her master's bed for about three minutes, and then suddenly fell down on the floor perfectly insensible. He removed her to her own bedroom, and sent for me. I arrived at ten minutes past seven (just forty minutes after she had taken the poison). I found the patient frothing at the mouth, perfectly insensible, skin cold, pupils natural, arms uplifted, and with severe convulsive twitchings of both legs. Pulse 130. She had never vomited. By means of the stomach pump, I injected a large quantity of tepid water and chalk. Vomiting was produced, the vomited matters smelling very strongly of carbolic acid. She gradually became conscious, and complained of "pain all over her," more especially in the throat and stomach.

* Messrs. Calvert & Co. state that "our No. 5 carbolic acid is composed of about 85 per cent. of carbolic and cresylic acids and their homologues. These acids are identical in their properties, but boil at different temperatures."

9.15 a.m.—Seems better; more conscious; great inclination to sleep—in fact, can hardly keep awake. Pulse 130. Ordered gruel, with plenty of salad oil.

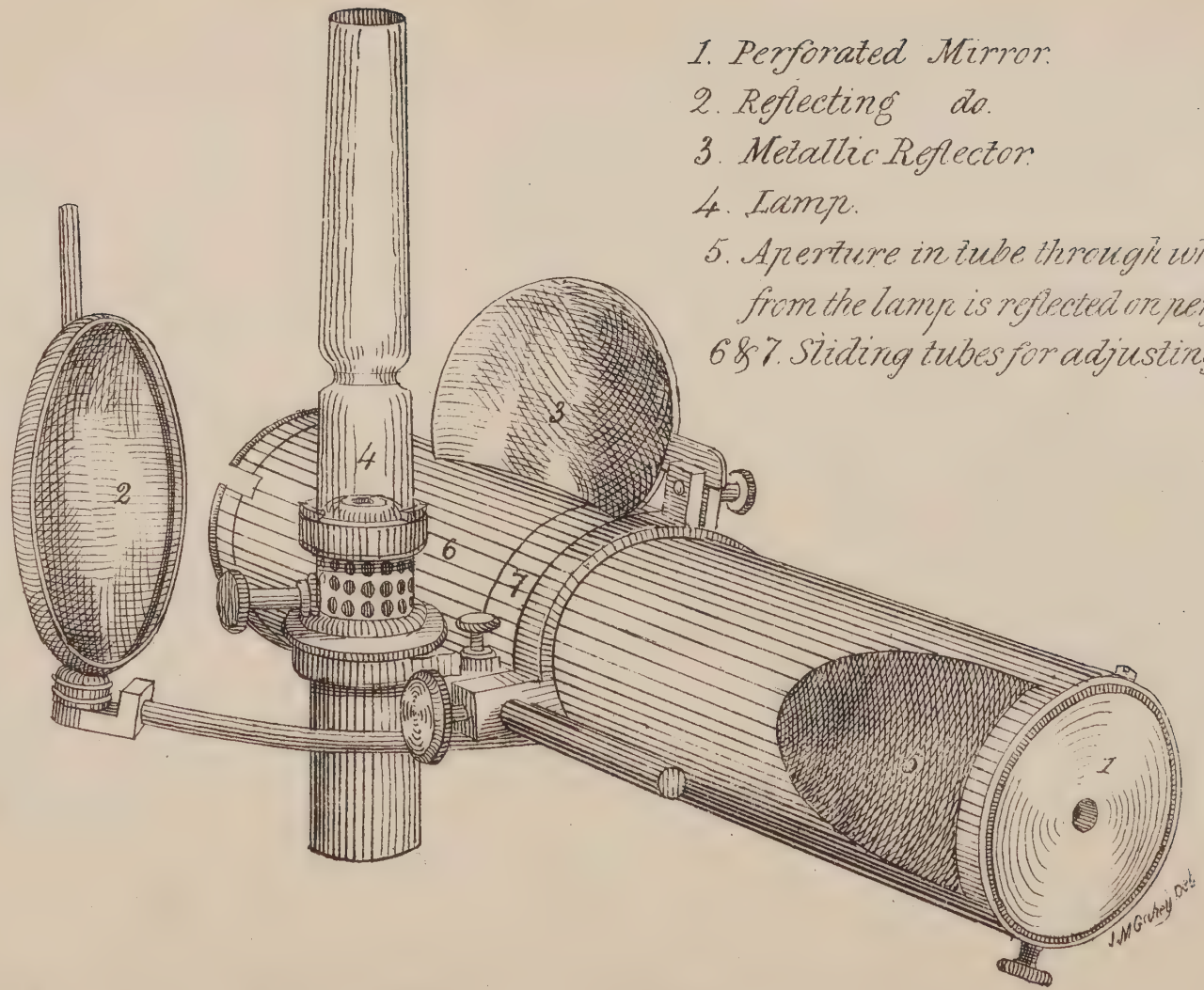
10.15 a.m.—Has been sick four times; quite conscious. On questioning her, she stated that she took the carbolic acid at 6.30 a.m., before breakfast time; felt "as if her inside was burnt out;" tried to drink some cold water, but found she could not swallow. About five minutes after having taken the poison, she felt very sleepy. Her legs felt as if they had "gone to sleep," numb, and no use in them, and afterwards as if they had been galvanised. She does not remember going into her master's room. She says that she drank the carbolic acid from the bottle mouth. I found the bottle of carbolic acid, and showed it to her. She told me the carbolic acid (and her master bore out the assertion) reached to the top of the fluting in the bottle. I carefully marked where the liquid reached in the bottle; poured the carbolic acid out, and filled the bottle with water; poured the water out as far as the mark, and measured. I found she had swallowed *fifteen drachms* of the solution of carbolic acid. She confessed to have swallowed it near the kitchen dresser, and none being found there, and none on the clothes, and judging from the severity of the symptoms, I am firmly of opinion that she swallowed the amount already stated.

1.30 p.m.—Says she feels better. Pulse 120. Complains of pain in throat and stomach. Mouth and throat excoriated. The lining membrane, and surface of tongue white, as if smeared over with caustic.

7.50 p.m.—Passed water for the first time since she took the poison. Sp. gravity 1010; acid. Very smoky, and containing mucus. No trace of blood corpuscles: no peculiar odour; nearly two pints in quantity. Ordered a dose of castor oil.

August 29.—9.15 a.m.—Pulse 100. Feels better; has passed water twice during the night, much clearer.

2.30 p.m.—Pulse 88. Complains of more pain in the throat and stomach; cannot drink anything warm. Has slept very much during the day. Bowels not yet opened. Ordered another dose of castor oil.



SELF ILLUMINATING OPHTHALMOSCOPE.

DESCRIPTION OF A SELF-ILLUMINATING OPHTHALMOSCOPE.

By T. R. GLYNN, M.B.
PHYSICIAN TO THE LIVERPOOL NORTHERN HOSPITAL.

The accompanying is a sketch of an Ophthalmoscope designed by me to facilitate the examination of the retinæ of patients when in bed, and to render their removal into a darkened room unnecessary.

Since the year 1868, I have used this instrument very frequently for examining the eyes of children and adults, suffering from cerebral and other diseases, and necessarily confined to bed. The illumination of the retinæ is not so intense, by means of this instrument, as it is by the instrument Dr. Beale has recently invented, much light being lost in reflection and in transit, but I find quite sufficient light reaches the fundus of the eye to render its examination easy and complete even in a bright room.

I need say little concerning the construction of the instrument, as it may readily be understood by a glance at the drawing.

The Ophthalmoscopic mirror is concave, with a focus of twelve inches, it swings on pivots (one of which may be screwed so as to fix it in any position), at the end of a light brass tube six inches in length.

On one side of this tube and close to this mirror is an aperture for the passage of the light from the reflector.

In this tube slides another, and at the further extremity of this is the convex lens (two inch focus).

Over this a shorter tube moves, and to its free extremity is adapted a pad to enable the instrument to rest easily against the brow and cheek. By this combination of tubes the focus is easily adjusted.

The reflecting mirror has a focus of four inches. It is held by a

very simple mechanical arrangement at a suitable distance from the lamp, and placed at a proper angle. It is at such a distance from the perforated mirror that the rays of light reflected by it may cross and become divergent, and illuminate the entire surface of that mirror.

The lamp is one of Young's small, argand camphine lamps with a smaller reservoir adapted. It is fixed in a convenient position against the lower end of the tube holding the perforated mirror.

The instrument readily takes to pieces so that it may more conveniently be carried.

It has been made for me by Messrs. Chadburn, of Liverpool.

SHORT NOTES ON DRUGS AND PHARMACEUTICAL PREPARATIONS OF RECENT INTRODUCTION.

By JOHN ABRAHAM,
PRESIDENT OF THE CHEMISTS' ASSOCIATION.

The most noted medicine of recent introduction is *Chloral Hydrate*. Its use originating in Germany, its manufacture has been almost, I should perhaps say entirely, confined to that country. The exaggerated expectations with which it was heralded have not been realised, and its consumption, so far as my experience enables me to judge, is not nearly so extensive as it was formerly; but I suppose there is no doubt that it will prove a valuable agent. It has been stated that an *Alcoholate* has been fraudulently substituted for the *Hydrate*, and that its properties are very different, and very inferior. The two are distinguished by the relative amounts of chloroform which they are capable of yielding, which is considerably less in the case of the alcoholate. An alarm was excited which has been shown to be unfounded so far as it relates to this particular substitution, and it rather appears that the quality of the chloral hydrate in the market in this country was remarkably uniform, differing mainly in the presence of a little more or less water, owing to its being somewhat hygroscopic. It has been suggested, however, that there may be present occasionally some unknown compounds of chlorine, which alter its properties, but I believe that none such have yet been detected. It may be observed that according to the experience of some observers, a very minute quantity of impurity may be expected to modify its action. This may be illustrated by the fact that there are in the market two chloroforms, one made from rectified spirit, the other from the mixture of rectified spirit with naphtha known as methylated spirit. I am not sure that it is possible by any ordinary

means to distinguish between them, and I was told by one of the most eminent manufacturers that they could not distinguish one from the other. But I am assured that the use for anæsthetic purposes of the one made from impure spirit is more liable to be followed by sickness than the similar use of the other.

The general use of *Phosphates* and *Hypophosphites* is a noticeable feature of the Pharmacy of the last ten years. Hypophosph*ites* in solution in water pass into Phosph*ates*, and I doubt whether their preparation in the form of syrup preserves them.

Hypophosphite of Lime is stable and may be administered as a powder, but it is not soluble in water.

Hypophosphite of Soda is soluble, but should not be kept more than a few days in solution. The Hypophosphites have not realised the sanguine expectations of their early advocates.

The *Phosphates* and *Syrups* of Phosphates have come largely into use, but all or most of the latter decompose in keeping. The Syrup of *Phosphate of Iron* of the Pharmacopæia is much in use. A syrup of *Iron, Quinine,* and *Strychnine* (also called Professor Easton's Tonic Syrup) is a favourite. It contains Phosphate of Iron, with one grain Phosph. Quinine, and $\frac{1}{32}$ grain of Strychnine in each drachm, which forms a dose.

A compound Syrup of Phosphates known as *Parrish's Compound Syrup of Phosphates,* and *Chemical Food,* is imported from the United States. It contains in one drachm about two-and-a-half grains Phosphate of Lime, one grain Phosphate of Iron, with smaller quantities of Soda and Potassa.

To the Syrup of Phosphate of Iron is sometimes added *Phosphate of Manganese,* half a grain to a drachm.

A feature of recent pharmacy is the use of *Granulated Effervescing* preparations. One of these has become wonderfully popular within a short time. It is known by the name of *Effervescing Citrate of Magnesia,* although it does not usually contain any magnesia. The type of this preparation is the *Sodæ Citro-Tartras Effervescens* of the Pharmcopæia, which is a very elegant preparation. Some of the manufacturers of the popular preparation add sugar, and, I think, a larger proportion of acid, and obtain even a more palatable preparation. The same ingredients

are also combined with a number of active medicines of which those known as *Effervescent Carbonate of Iron* and *Effervescent Carbonate of Lithia* are the chief. Effervescent *Citrate of Quinine, Citrate of Quinine and Iron, Citrate of Bismuth and Pepsine, Bismuth, Pepsine and Steel, Vichy Salt, Citrate of Potash*, &c., &c., are also in use. With regard to these preparations, it should not, however, be assumed that the patient really takes Carbonate of Iron, Carbonate of Lithia, &c. The effervescence is produced by the reaction of Tartaric and Citric Acids on Bicarbonate of Soda; but in the presence of these acids, it is not to be expected that the liberated Carbonic Gas should seize the Iron, Lithia, &c. The fact in question will be still more apparent when an attempt is made to produce an *Effervescent Iodide of Iron.*

The waters of various *natural springs* have come into large demand. The chief of these are the *Vichy*, the *Friedrichshall*, and the *Vals*, of the foreign springs, and the *Harrogate* of our own country. The latter are divided into the *Sulphureous* and the *Chalybeate*, and the usual taste of iron solutions is completely masked in the latter by the introduction of carbonic acid. Of the other springs, those I find chiefly asked for are the *Pullna*, the *Carlsbad*, and the *Kreuznach.* The latter is concentrated into a *solution*, and also into a *salt* which is used in baths.

Of *dietetic* articles I may name the *Extracts of Meat* and *Sugar of Milk.* The former as a food for invalids, the latter for children, is largely consumed.

In connection with these may be mentioned *Pepsine, Pepsina Porci, Wine of Pepsine*, and *Liq. Pepticus. Præp., Pepsine* and *Pepsina Porci* are names used to signify an active principle combined in an uncertain proportion with starch. Both are in considerable favour.

The *Oil of Theobroma* (Cacao butter) has been a valuable addition to pharmacy, especially for the exhibition of medicines by the rectum and vagina. Applications of this nature, which were almost unknown, as respects the latter organ, twenty or thirty years ago, are now greatly in demand, and the oil of theobroma is the medium generally preferred, on account of its firmness when cold, and its low melting point. But a mixture of gelatine, glycerine,

and water, forming a soft elastic body, easily soluble in mucous secretions at the temperature of the body, is sometimes used, and, I think, will be found deserving of notice. The introduction of carbolic acid, pure, impure, and compounded, is a noticeable feature, the particulars of which are well known. The *Sulpho-Carbolates* of *Zinc*, *Soda*, and *Potash* are used. The use of the articles called *Marine Lint*, *Tenax*, and *Carbolised Tow*, may be mentioned in this connection.

Bromide of potassium is in large demand, although chloral hydrate seemed on its introduction to be tried as a substitute. The *Bromides* of *Ammonium*, *Iron*, *Quinine*, and *Sodium* are also in use. *Acetate of Iron* in solution has a very agreeable taste. The officinal tincture is not found to keep, but the *Ethereal Tincture of Acetate of Iron*, of the German Pharmacopæia, is a good preparation. The dose is twenty minims. *Rubini's Tincture of Camphor* is in popular demand. It is a strong spirit of camphor made by dissolving camphor in its own weight of alcohol (not spirits of wine).

Sulphurous Acid, after having been much over-praised, is still in moderate demand. It varies much in strength, and is liable to change. A solution of *Bisulphite of Lime*, in which the sulphurous acid is loosely combined, which was introduced for the preservation of meat for food, has valuable applications corresponding to those of sulphurous acid. The *Sulphites* and *Bisulphites of Soda* are analagous preparations, but they do not smell of sulphurous acid. A mixture of chloride of sodium and oxide of manganese, to which is added a dilute sulphuric acid, is used for the production of *Chlorine Fumigation* where a large quantity is wanted in an unoccupied apartment. Hydrochloric acid is added to oxide of manganese where a slower development is required, but this may be hastened by the application of heat.

Oxalate of Cerium continues to be prescribed, and (largely) *Carbonate of Lithia*. The *Resin of Podophyllum* is in established demand.

A preparation called *Vin Diuretique d'Hotel Dieu* is in use. It is composed of *Squill*, *Juniper Berries*, *Digitalis*, and *Acetate of Potash*, infused in white wine. The dose is half-an-ounce.

I conclude these notes with the names of a few other medicines, more or less recent, which are in occasional demand :—

Alumen Ferricum.

Ammoniæ Benzoas.

" Valerianas.

" Phosphas.

Ammonii Iodidum.

Amyl Nitrate.

Cinchoniæ Murias.

Codeia.

Ferri Phosphas.

Ferri Valerianas.

Furfurine and its Nitrate.

Glycerinum Acidi Carbolici, Acidi Tannici, &c.

Hydrogen Peroxide.

Iodoform.

Liq. Bism. et Ammon. Cit.

Liq. Potas. Permang. (Instead of Condy's Fluid).

Manganese Peroxide (pure) ; dose, five to ten grs.

Methylene Bichloride (for inhalation).

Ol. Cadii (Huile de Cade, Empyreumatic Oil of Juniper).

Ol. Pini Sylvestris (for inhalation).

Potassæ Citras.

Pruni Virginiani Cortex (the infusion is the usual form of administration).

Sodæ Citras.

Sodæ Hyposulphis.

Sulphuris Hypochloridum (a powder resembling sulphur sublimatum, composed of sulphur, with an uncertain proportion of chlorine in loose combination).

Triticum Repens.

Zinci Benzoas.

" Valerianas.

Tabular View of the Major Operations performed in Liverpool, dur

	Royal Infirmary.		Northern Hospital		Southe Hospit	
	Recovd.	*Died.*	*Recovd.*	*Died.*	*Recovd.*	1
Excision of the shoulder joint	1	..	..	..	..	
" elbow joint — primary	..	1†	..	.	..	
" elbow joint — secondary	7	..	1	..	..	
" wrist joint	1	..	..	..	..	
" ankle joint (secondary)	1	..	..	..	..	
" hip joint	1	1*	..	..	..	
" knee joint — primary	..	..	1	..	..	
" knee joint — secondary	2	..	..	..	..	
" upper jaw	1	..	..	..	..	
" lower jaw	1	..	1	..	..	
Amputation through the shoulder joint (primary)	..	..	..	1†	1	
" of the arm — primary	3	1†	..	..	1	
" of the arm — secondary (for disease)	1	..	..	..	..	
" " forearm — primary	3	1*	2§	..	2	
" " forearm — secondary	2	..	..	..	..	
" " hand (primary)	..	..	..	..	1	
" " thigh — primary	2	2¶†	..	2*	..	
" " thigh — secondary — for disease	10	4†††*	1	..	1	
" " thigh — secondary — for injury	1	1†	..	1*	1	
" through the knee	1	..	..	1†	..	
" of the leg — primary	1	2††§	3	..	..	
" of the leg — secondary — for disease	3	1†	1	..	..	
" of the leg — secondary — for injury	1	..	2	..	..	
" " foot — primary	2	..	1	..	..	
" " foot — secondary	1	..	1	..	..	
" " penis	1	..	..	..	..	
" " cervix uteri	1	..	..	..	..	

‡ Died of Smallpox. * Died from Exhaustion. † Died from Pyœmia. § O

OYAL INFIRMARY, NORTHERN, AND SOUTHERN HOSPITALS IN IE YEAR, 1870.

	Royal Infirmary.		Northern Hospital.		Southern Hospital.	
	Recovd.	*Died.*	*Recovd.*	*Died.*	*Recovd.*	*Died.*
Excision of the whole tongue	2	..	..	..	..	..
Operation for ununited fracture of forearm	..	..	..	..	1	..
Lithotomy (lateral)	3	..	1	..	2	..
Ligation of the carotid artery (for aneurism)	..	..	..	..	..	1
„ „ femoral „ „	3	..	..	1†	..	..
Herniotomy	2	4	2	1	1	1
Perineal Section	2	1*	..	..	..	1
Paracentesis thoracis	..	..	..	..	..	1
Castration	..	..	1	..	..	..
Tracheotomy (for disease)	1	..	1	..	..	3
Trephining	1	..	..	..	2	2
Extirpation of mamma	5	1†	1	..	..	1
„ eyeball	1	..	..	..	1	..
„ tumours	14	..	1	1	..	..
Staphyloraphy	2	..	..	..	..	..
Plastic operation, for cancrum oris	..	..	1	..	..	..
„ ruptured perineum	2	..	..	..	..	..
„ extroversion of bladder	1	..	..	..	..	..
Removal of diseased bone	7	..	2	..	4	..
„ loose cartilages from knee	2	..	..	..	..	..
Free incision of diseased ganglia	1	..	..	..	..	..

ese was a Double Primary Amputation. ¶ One of these died from Secondary Hœmorrhage.

ABSTRACT OF THE PROCEEDINGS OF THE LIVERPOOL MEDICAL INSTITUTION.—SESSION 1870–71.

Paper I.

On the Non-registration of Still-born Infants.

By F. W. Lowndes, M.R.C.S. Eng.

The author began his remarks by referring to the prominent manner in which the subject of infant mortality had been lately brought before the public in its various phases of baby-farming, child murder, &c., and considered that our registration laws were, in a great measure, to blame for the indifference shown to infant life, by making no provision for the registration or recognition of still-born infants. The registration of births and deaths commenced in 1837, prior to which time the only record of births was such as could be obtained in the register of baptisms—a column being generally left for the date of birth. When it is borne in mind how large a number of persons are not baptised till they have reached adult age, and how many are not baptised at all, it is obvious the record of births must have been very inaccurate. In 1837, an Act was passed regulating the registering of births and deaths. The author showed that, elaborate as the rules of this Act were, there was still one serious defect, viz., that no account whatever was taken of still-born children. The instructions issued to the Registrars are as follow:—"Still-born children must not be entered either in the register of births or of deaths; but, if a child is born alive, although it dies immediately after birth, both the birth and the death must be registered separately in the proper form." If any alteration is to be made in the existing law, it must be for better reasons than mere curiosity, or even the accumulation of what might prove valuable scientific material. Mr. L's attention was drawn to the subject by observing the varieties of practice in different parts of the country. One surgeon, for

instance, informed him that although the child might be born alive, yet if it lived only for a very short time, he frequently gave the parents a certificate of still-birth, when they were very poor, in order to save the extra expense to which they would otherwise be put. He admitted that this was both irregular and improper, but excused himself on the ground that it saved poor people expense, and could do no harm. The author's experience—as formerly an assistant to three different practitioners, as Resident-Surgeon to the Birmingham Lying-in Hospital, and as Assistant-Surgeon to the Ladies' Charity here—and his opportunities for observing the various regulations that are adopted in different places to meet the deficiency in the Registration Act, have been considerable. Sometimes in a genuine case of still birth he was asked for a certificate, in other instances he was not asked, and on volunteering to give one, was informed that it was unnecessary, as the child could be buried without one. One gentleman, whom the author once assisted, made it a rule to give no certificate of still-births; and during one twelvemonth at least six cases of still-births occurred under the author's observation, where the children were all interred in the various churchyards without any certificate or enquiry whatever. This state of things has not existed without already calling for remark. In All Saints' Cemetery, Newcastle, five hundred and twenty-one interments of still-born children occurred within seven years; and their non-registration was mentioned by the Registrar of Newcastle as a matter of regret. Again, in the *Lancet* for July 13th, 1869, occurs an important article on this subject.

Mr. Lowndes here gave a number of statistics bearing upon the point, among which he found that the proportion of still-births to the total number of births varies from 3.29 per cent. in Prussia to as low as 0.80 in Russia, and it appeared to be a general rule that the higher we ascend in the scale of civilisation, the greater is the number of still-births. Dr. Ballard even makes the ratio as high as 5 per cent. in European countries; and in New York it is as much as seventeen and eighteen per cent. In an article on Baby-killing, in the *British and Foreign Medico-Chirurgical Review*, after strongly advocating the registration of still-births,

Dr. Ballard remarks:—"Human nature is much the same everywhere, and where there is no fear of detection, the temptation to a criminal neglect of those precautions which the accoucheur takes to preserve the life of the child during the act of parturition is probably too strong to be resisted in many cases where opposing motives have little cause for existence." Dr. Lankester states that out of one hundred and thirty-six inquests held on the bodies of infants, in one hundred and nineteen a verdict of still-born was found, and he believes there is as good reason for supposing that their lives were sacrificed, as there is of those who breathed after they came into the world. Dr. Lankester based this opinion on the fact that these children were found with the cord untied, and with other signs of the neglect of any attendance upon the mother during her delivery; moreover, they were found deposited in gardens, lanes, and quiet places under the same circumstances as live-born children.

Mr. Lowndes next showed how suspended animation, being a very common occurrence in the newly-born infant, may very easily be allowed to pass into death, where only shame can occur from the child being permitted to live; and he quoted some very extraordinary revelations by Mrs. Meredith, detailed to the Social Science Congress, which showed that women prisoners were thoroughly acquainted with the art of child-murder, and had in many instances quite a contempt for infant life. The older prisoners teach the younger ones, and they consider it quite a mean thing to be found out.

In Scotland, the undertakers are required to furnish a report of every person buried by them within three days after the funeral; but Mr. L. found that in the case of still-born children no such report was required; and on enquiry at Somerset House, he discovered that no penalty was incurred even by persons who gave a false certificate of still-birth. By personal inquiry, Mr. L. learned that in all cases of still-birth a certificate from a doctor or a midwife is required by the cemetery authorities. The fee for interring a still-born child is, in all cemeteries, less than for one that has lived—the difference being from 1s. 6d. to 7s. 6d. This is, of course, a great inducement to fraud.

A table, showing the number of interments annually, was added, and the author stated that the officials at the various cemeteries which he had visited, expressed, without exception, the opinion that the present arrangements were very unsatisfactory. Some of them, indeed, stated that persons burying still-born children insisted on seeing them buried with their own eyes at once, or else carried them straight away to another cemetery; for which indecent haste no good motive can be suggested. Mr. Blake, the Coroner's beadle, having been appointed to examine a Liverpool mortuary daily, has detected many cases of children two or three days old being brought there as still-born, and he has been the means of discovering several examples of foul play. As to the check imposed on parents by a certificate from the person who delivered the child being required, this, no doubt, is very well in cases where qualified medical men are present; but among the poor it is almost entirely midwives who officiate at confinements, and upon their integrity little reliance can be placed, while their ignorance is often amusingly manifested in the certificates they give.

Paper II.

On the Employment of the Sphygmograph in Determining the Action of Remedies.

By Wm. Carter, M. B., Lond.

After some introductory remarks on the variations observable under different conditions in the line of ascent, the apex, and the line of descent of the sphygmographic curves, and the conclusions that were capable of being fairly drawn from such variations, the author explained that in all the cases he should have to adduce, the sphygmograph had been applied to the same (left) radial artery, and that two tracings were always made as closely as possible to each other on the same glass—the one before, and the other after the application of the remedy—so as to admit of a ready comparison. The agents employed were—the warm bath, alcohol, nitrite of amyl, ipecacuanha (to produce emesis), digitalis, aconite, chloral hydrate, belladonna, and veratrum viride.

The Warm Bath.—The entire body was immersed in a bath at

98° F., and the tracing taken almost immediately afterwards. A very striking change, affecting chiefly the apex and line of descent of the sphygmographic tracing, was observable. Before the bath the apex was much rounded, so rounded, indeed, that an almost horizontal line of some length connected the lines of ascent and descent, while the latter was nearly mathematically straight—the merest ripple occurring near its commencement. Immediately after entering the bath, the apex became exceedingly sharp, the ascending and descending lines forming an angle of considerable acuteness, often not more than 45°, while the angle formed by the extension of the corresponding lines upwards under ordinary circumstances, was never of less value than 90°. Besides this alteration of the apex, the line of descent, instead of being straight, was broken by a deep notch, indicative of increased dicrotism. These alterations seemed to point to the following physiological effects of the warm bath, viz., a diminished resistance to the passage of the blood through the swollen arteries and capillaries without any great diminution of the force of the systole. The ascending line on the tracing was as high during the bath as before, showing that the force with which the left ventricle acted was, therefore, not much, if at all, diminished. The instantaneous descent of the lever on the conclusion of its ascent, and the obliteration of the previously existing horizontal line between its rise and fall, point clearly to the disappearance of a state of tension in the small arteries and capillaries which exactly balanced the force exerted in the latter part of the systole. The secondary curve indicated also diminished resistance.

Alcohol—in the form of whisky-punch (one ounce of Irish whisky to two ounces of hot water)—produced a vertical line of ascent as the chief variation from the normal tracing. The left ventricle, therefore, under the stimulating influence of alcohol, acts quickly as well as strongly. There was no indication of diminished tension in the arterial system.

Nitrite of Amyl—was administered by inhalation, five drops having been placed on a cone of blotting paper, which was held over the nose and mouth during inspiration. Flushing of the face, and a sense of fulness in the head immediately supervened,

and concomitantly with these effects there were the following changes in the tracings :—A much greater number of pulsations in a given time, the proportion being as nine to five; a short, but oblique line of ascent; a rounded and an unbroken line of descent. From these indications it was concluded that the physiological effects of the drug, such as the sense of fulness, &c., depended probably upon an exactly opposite condition to that which was often stated to cause them; and that instead of capillary paralysis, and a consequent free passage of blood through the system, there was an undue amount of resistance, which, coupled with a very rapid and somewhat vigorous systole, kept the capillary system in a constant state of tension. It was remarked that the mere fact of increased frequency of the pulsations could not alone account for the entire absence of a secondary curve in the line of descent if there had been a condition of capillary paralysis; because, in the pulse of typhus, in which this prevails, such a curve is always well pronounced, however rapidly the heart may act.

From the appearance of the tracings during the administration of Digitalis, Dr. Carter was inclined to the opinion that this drug acted as a cardiac tonic; but he would not speak decidedly on this point till he had made further observations.

In the other tracings there was not sufficient change to call for special remark.

Paper III.

On the use of Tobacco in Ileus.

By James Vose, M.D.

The author regretted that writers of such eminence as Pemberton and Bright had omitted—the one in his work on various diseases of the abdominal viscera, and the other in his Gulstonian lectures, "On the Functions, &c., of the Abdomen,"—to treat of such an important disease as ileus. We are indebted mainly to Abercrombie for the earliest successful attempt to discuss the subject of ileus in a broad and scientific spirit. In the absence of strangulated external hernia and of stricture of the large intestine within reach of the surgeon's finger or instruments, the diagnosis is for the most part more or less conjectural. Hence, the most

sagacious and experienced physician may be at fault as to whether a case be one of "simple ileus," to use the language of authors, or of ileus "with previous disease of such a nature as seemed to act by deranging the muscular power of the canal *without* mechanical obstruction," or of ileus "with mechanical obstruction or other organic changes in the structure of the parts." Inasmuch, therefore, as our perplexity arises from the enquiry having to be directed to a condition of viscera removed from sight, it is our duty to persevere with judicious treatment to the last, and here, if anywhere, we should give a patient the benefit of our doubts, and never discontinue efforts for his relief—remembering that in ileus, as in fever, recovery is known to occur even at the eleventh hour, when friends are in despair, and regard further interference as the mere pedantry of art.

The author narrated three cases illustrative of the success following the treatment he advocated. A lady—at the seventh month of her first pregnancy, and who had been for some time disturbed by uneasy sensations in the region of the ascending colon, which could not be accounted for—became affected with nausea, vomiting, and obstinate constipation; in short, with unmistakable symptoms of ileus. All the usual means were diligently applied for her relief, but they proved unavailing. After much anxious deliberation, in consequence of her condition, it was decided that a supreme effort should be made to save her life, and that, although she was pregnant, tobacco should be had recourse to. Accordingly, the enema was employed repeatedly, and with every possible precaution. Again and again the patient was brought under the physiological influence of the remedy as indicated by the occurrence of palor, giddiness, and faintness. At last the bowels began to act, the vomiting ceased, and she recovered completely—utero gestation going on to the full term, and the child being born alive.

The next case was as follows:—An elderly man, a free-liver, became the subject of ileus. A variety of remedies were tried, but without effect; very large doses of calomel were next exhibited, and with the same result. It was then decided to use tobacco injections. This was done, and repeated, but unavailingly.

Lastly, tobacco was applied to the external surface of the abdomen in the form of cataplasm. Happily this succeeded, and the patient made a satisfactory recovery.

The following are the particulars of the third case. On the 11th of last month, Dr. V. saw a young lady, aged fourteen, who had been indisposed since the 5th. The patient was considered to be suffering from peritonitis, but he did not feel satisfied of this. Upon being summoned again, three days later, he expressed a fear that the symptoms were referrible to ileus, and that proved to be too true. Frequent pulse, vomiting, tumid, doughy abdomen, and constipation were present. Simple enemata, mild aperients, fomentations, and opium, to the extent of eight grains in combination with six minims of croton oil, in divided doses at intervals were tried, but without success. Tobacco cataplasms were next applied, and with a like result. Three injections of fifteen, twenty, and twenty-five grains of tobacco, infused for ten minutes in six ounces of boiling water, being thereafter administered, complete relief was obtained, the injections being followed by alvine discharges, and by a rapid diminution of the fever vomiting and abdominal fulness, the obstruction of the bowel having lasted altogether for about twelve days.

The two cases last cited furnish a good example of the waywardness and caprice of the animal economy in relation to the influence of remedial means, for, whereas, injections failed in the one, while cataplasms succeeded; cataplasms failed in the other, while injections succeeded.

That the tobacco treatment may be adopted with perfect safety, under proper precautions, is evinced by all the three cases, and emphatically by the first, where it was pursued in a patient at the seventh month of pregnancy, without causing miscarriage or any other untoward accident. These cases illustrate, not only an important fact in therapeutics; but, exhibit also the value of this powerful remedy, which is almost entirely ignored by the profession at present in its literature and in its practice.

As an example of this, Dr. Vose remarked that, the late Dr. Brinton, in an elaborate essay on Intestinal Obstruction, based on his Gulstonian Lectures, speaks hesitatingly of the virtue of

tobacco, rather damnifying by his faint and qualifying praise, than advancing its reputation by his advocacy. Mr. Cadge, surgeon to the Norfolk Hospital, in a memoir entitled "Cases of Intestinal Obstruction, with Remarks," published in the *British Medical Journal*, December, 1868, says, "of all the other methods of relief, as tobacco enemata, inflation, galvanism, cold affusion, crude mercury, &c., I say nothing, because I have nothing practically useful to say." But, having made such a confession, Mr. Cadge should surely have been on his guard not to catalogue an agent like tobacco with such therapeutic extravagances as inflation and crude mercury. Again, the late Dr. Tanner expresses himself in the following manner regarding this remedy:—"Inasmuch as I should never resort to the use of crude mercury in doses of one or two pounds, or of small shot, or of strong tobacco injections, these agents need not be noticed except to mention that they have each been recommended." Now, as Dr. Tanner's work enjoys considerable popularity, especially with medical students, it is dangerous, and, of course, reprehensible, of any author so placed, to express strong opinions, and in a contemptuous tone, upon important practical topics about which he either knows nothing, or to which he has given a merely perfunctory attention. Sir Benjamin Brodie, towards the close of his career, remarked that, "it must not be supposed that we have advanced alike in all departments of Surgery," and we may, perhaps, be permitted the liberty of extending his observation to the practice of physic.

In conclusion, the author contended that if a patient suffering from ileus be allowed to succumb without a fair trial of tobacco, the treatment has been incomplete, and a remedy has been withheld whose employment might have led to recovery. Like other medicines, tobacco must not be employed timidly nor rashly, but with prudent boldness, when it will prove to be always a safe, and often an invaluable remedy.

Paper IV.

On Relapsing Fever.

By I. de Zouche, M.D.

This paper has been revised, extended, and carefully rewritten by the author, and it will be found *in extenso* at p. 86.

Paper V.

On the Cause of the High Death-rate in Liverpool.

By John Newton, M.R.C.S. Eng.

The author pointed out in detail the many natural advantages possessed by Liverpool, not only over the great manufacturing and factory towns of England, as Manchester; but over most seaports, comparing it with Hull and London. Built on a series of hills, gently sloping towards the sea, where it forms a magnificent natural harbour, the site of Liverpool combines all the requisites for health as well as for business. It has been the constant theme of praise even from those who came to find fault. Thus, Dr. Lyon Playfair reporting in 1843 on the alleged causes of the excessive mortality in Liverpool, praises the beautiful situation of the town, its free exposure to the westerly wind, and the facilities which it offers for an effective system of drainage, and of cleansing. Moreover, Dr. Stallard is constrained to admit that it would be impossible to select a fairer or healthier site for the localisation of half a million of people than that of Liverpool.

Mr. Newton next gave extracts from Moss' *Liverpool Guide Book* (1801), written by an eminent surgeon of this town, and from various works of travel, to show that at that date, the death-rate of Liverpool was lower than that of London, and its inhabitants were noted for their healthy appearance. But in 1844 Liverpool was reported by Dr. Duncan as the most unhealthy city in the kingdom. Since that period immense sums have been expended, and great exertions have been made, by the Town Council and by the Select Vestry, to improve the public health. How costly these were, many of us know from our enormously increased taxation for sanitary purposes. The sewering of the town, and its water supply, are equal to those of any city in the world. Thousands of privies have been compulsorily changed into water-closets. Committees and sub-committees have met and reported, and what is the result? That the death-rate this year will probably be as high as that for any year since 1848; yet many causes which swell the death-rate in manufacturing towns (*e.g.*, deleterious occupations, confinement in factories, &c.,) are

here entirely absent. There is, then, only one cause remaining, viz.:—the habits and character of the population.

The author then gave the results of his observations during nearly four years residence as Parish Surgeon in the greatest fever-centre of Liverpool. The greater portion of this district was filled to overflowing with poor Irish and their children, whilst hordes of new-comers were continually arriving by the steamers; and these at once repaired to this district and settled down in its streets in their unmitigated filth. A graphic description was given of their extreme uncleanliness, pauperism, drunkenness, unthriftiness, and savagery; of their habits of theft, lying, and beggary, their intolerance of the English, and their custom of waking the dead.

In these districts the Irish fever, *i.e.*, typhus, is always present. It is also being constantly imported, as in 1847 and 1848, when three millions of Irish poor flocked into Liverpool within twelve months, and it became, as described by Dr. Duncan, a true city of the plague.

The fever and cholera districts, the pauper districts, and those of violent death were shown by Mr. Newton to be identical, and to be also those parts of Liverpool inhabited chiefly by the Irish. The Reports of Major Greig, and of the Rev. Jas. Nugent, with the Letters of Mr. Jas. Whitty, and of Bishop Goss, were quoted to prove that the workhouse, the parish schools, the fever sheds, the bridewell, and the borough gaol, were for the most part filled with Irish. Professor Jevons's recent address before the British Association, 1870, was also quoted. All the great towns having a high death-rate, Liverpool included, possess one thing, and only one thing, in common—and that is a large resident population of poor Irish. Liverpool, it is true, contains a great number of Scotch and Welsh emigrants—the latter, seventy years ago, being the chief foreign element; but both these classes of strangers are thrifty, sober, and law-loving, and they constitute but a small minority in comparison with the vast numbers of Irish who have overwhelmed the town since the establishment of steam-communication.

In conclusion, the author maintained that the unhealthiness of

Liverpool, otherwise so inexplicable, arises from one cause, and one only, viz.:—the existence in its midst of an enormous number of the emigrant Irish, who, with their children, are daily recruited by fresh hordes from Ireland—as ignorant, pauperised, lawless, and savage, as themselves, setting at defiance all sanitary regulations, and neutralising the best laid schemes for improving the health of the town.

Paper VI.

On Uterine Fibroids.

By Thos. Skinner, M.D.

This paper has been revised, extended, and carefully rewritten by the author, and will be found at p. 1.

Paper VII.

On Male Chlorosis and Allied Diseases.

By T. Inman, M. D.

The author's desire in this paper was to call attention to a group of diseases which have, in common, a peculiar condition of the blood, and generally, but not always, a waxy appearance of the skin. These complaints have received various names — chlorosis, leukœmia, purpura, scurvy, hæmorrhagic diathesis, and the like; but, although we have assigned cognomens to them, we are to a great extent ignorant of their true nature. Let us take chlorosis for an example. In that disease we find the blood deteriorating gradually in quality, the patient's strength diminishes, the discharge common to healthy women becomes scanty or ceases altogether; but there is no tendency to hæmorrhage, and, as a general rule, large doses of ferruginous tonics effect a cure in a short space of time. So common is this restoration to health with the use of strong chalybeates, that a very common formula was "Chlorosis is caused by a want of iron in the blood." This did not, however, explain why the globulin was originally diminished, and in what way the metal operated to increase it.

After noticing the fact that the extreme pallor, and many of the other symptoms characteristic of chlorosis were coincident with many gastric affections, especially with gastric ulcer—which, like

true chlorosis, attacks young women chiefly — Dr. Inman observed that between true chlorosis and such cases as the following, he could not see the smallest distinction. Mr. E., when about forty years old, began to find his health fail, his skin became white and waxy, his blood watery, his strength slowly declined, but there was no emaciation, and no discharge of blood, nor any excessive secretion. Pilgrimages to doctors and to various spas all proved useless, death ensued, the power of digestion remaining to the last. His body was, after death, carefully examined by Dr. Vose, Mr. Worthington, and Dr. I., yet no evidence of disease could be found; the lacteals of the mesentery were filled with chyle, the thoracic duct was large and pervious, and the heart was healthy. The only organ diseased was the blood, in which the globulin was so sparsely represented that the fluid barely tinged a white handkerchief. Here was chlorosis in the male.

The next case which came under Dr. Inman's observation was in a man originally powerfully built, and who retained his fleshiness to the last. In him the disease had come on slowly, but had advanced in spite of every remedy. When Dr. Inman saw him he had been ill for more than six months, and appeared to be a typical case of chlorosis. He was sallow and wax-like, very weak, without a stain upon the skin, and without any bleeding or inordinate discharge. His appetite was fair, and his digestion good. His urine was natural, and no disease could be detected except in the blood. In two days the man died, but no autopsy was allowed. More recently Dr. Inman had had under his care in the Royal Infirmary, a young woman, whose case seemed to be one of pure chlorosis, but where all forms of steel proved useless. Her urine, when examined, was found to contain albumen; but what the connection can be between a chlorotic-looking skin and renal disease, it is difficult to understand.

At the time this paper was written (Oct. 1870), the author had under his care a man about forty-five years old, whose symptoms were precisely those of a chlorotic girl; but, unlike the other cases narrated above, this patient had a tendency to bleed from the nose and bowels. The complaint came on very gradually and progressed, in spite of sea air, generous diet, cod liver oil, &c. About three

years before the present attack commenced, the patient was threatened with phthisis, but recovered perfectly. He improved for a while under the use of steel, friction of the body with turpentine and oil, and milk with brandy; but quite recently Dr. Inman had heard of his death from epistaxis. Another patient, of about the same age, suffered also from the symptoms of pure chlorosis. There was no bleeding or any discharge, but simply a steady sinking of the vital power without any emaciation or dropsy. Two years elapsed between the first indication of failing health, and dissolution, and during the whole of this time every hygienic and medicinal agent that could be thought of was successively but unsuccessfully used.

A short time ago Dr. Inman had in the Royal Infirmary a male patient, who, with the appearance of chlorosis, combined the hæmorrhagic diathesis. During the last two years he had been bleeding from the nose or mouth, or both. Few days have elapsed at any period without a discharge of blood. But the man, though pale, is not emaciated, and the only tangible complaint beyond that referred to, is a swelling situated above the right wrist, and which appears to be due to periostitis. He has not yet exhibited any purpuric spots. He left the hospital, after having been resident there about six weeks, without having derived any apparent benefit from treatment.

Another case was seen by Dr. Inman in one of Dr. Turnbull's wards, but in this instance, though there was no appearance of chlorosis, he suffered almost daily from hæmorrhage from the nose, or mouth, or bowel. Every inquiry made into the history of these cases failed to discover any adequate cause for the disease, and none of the patients were benefited by treatment.

One day Dr. Inman found in his wards in the Royal Infirmary, a young woman, who looked as if she had been the victim of frightful brutality. Her eyeballs were bloodshot, her eyebrows and eyelids livid and distended like a prizefighter's after a pugilistic encounter, her nose was swollen with effused blood, and her lips enormously enlarged, and apparently bursting with the quantity of clots below the surface. A stream of blood flowed from the angles of the orbit, from both nostrils, and from the mouth. Her urine

was more bloody than aqueous, and a quantity of gore came from the vagina and the bowels. Dr. Inman had never before seen such a sight. The girl stated that she had gone to bed perfectly well on the preceding night, and awoke next morning in the plight described. Up to that period her mode of living had been in every respect normal, nor could any cause be found for the phenomena. Within a few days another young woman was admitted into the Infirmary with analogous symptoms. The resemblance between these cases was as perfect as it possibly could be, in their symptoms, in the suddenness of their invasion, in the universality of the bleeding, and in the absence of anything to account for the attack. The former patient recovered in less than a month, and lost all trace of the disease in six weeks; the other, who was treated on the same plan, died before the end of a fortnight. In the families of neither of these patients was there any history of consumption, and this fact, so far as it goes, deserves to be noticed for this reason, viz.: that although there is no type of disease in which the hæmorrhagic diathesis is more common than it is in the phthisical, yet consumptive patients rarely exhibit such severe symptoms as those we have described, nor even the mildest form of purpura. Epistaxis occurs exceedingly frequently during the youth of those liable to tuberculosis, so also is menorrhagia common in females predisposed to phthisis. Hœmoptysis is a general harbinger of phthisis, and in cases such as these, a cut or wound shows no tendency to cease bleeding. Yet, with all this, nothing is more rare in phthisis than to meet with hœmaturia, or with a discharge of blood from the bowels. Again, there is perhaps no form of disease in which we find purpuric spots more commonly than in sea and occasionally in land scurvy; but, although in this complaint we have spongy gums and great debility, we rarely, if ever, find discharges of blood from any of the organs of the body. The same remarks apply to albino-ism, the lead or melanosis cachexy, and Bright's disease. In many cases of ague the colour of the face has changed during the first rigor to a sallow, wax-like hue closely resembling chlorosis, and has been improved again by the first dose of quinine. The pallid colour attending enlargement of the spleen has often been noted by writers, and, as a natural con-

sequence, this viscus has been supposed to be a blood producer. We may also notice here the peculiar bronzing of the skin sometimes, but not invariably, accompanying tubercular or other disease of the suprarenal capsules, which is unattended by a tendency to hæmorrhage from the mucous surfaces.

Dr. Inman next referred to the excessive pallor often met with in acute rheumatism, making the patient look as white as well-bleached wax, also the sallowness attending the cancerous cachexia, and the whiteness accompanying long-continued small, or sudden and great, losses of blood. He inquired whether great pallor of the skin was by itself to be considered as a symptom of disease, and concluded that if unattended by debility it was not to be valued as such, instancing the pallor acquired by Europeans resident in India, and of persons who have been severely marked with small-pox.

What is that complaint, then, of which it is the visible sign? We have seen that it may indicate tuberculosis, struma, the cancerous cachexia, disease of the kidney or of the spleen, ague, excessive loss of blood, and the like. But if none of these are present what shall we say? Can we say that male chlorosis without loss of blood from any organ is identical with what by way of contrast we may call the hæmorrhagic diathesis? Are either or both allied to struma, to tuberculosis, or to any known disease? The only answer Dr. I. can find to these queries is that the evidence of which we are possessed points to the fact that male chlorosis or the analogous disease in elderly women is an affection *sui generis*, of which we at present know nothing excepting its symptoms, and that the diseased condition in which general bleeding takes place spontaneously is equally incomprehensible. So far as he is able to discover, this type of affections is not hereditary. They are not allied by family ties to any known disease, nor can they be traced to the use of any particular diet, or to the deprivation of any element of food. It is true that we frequently see alcohol-drinkers pale, but the patients he referred to were always temperate. Indeed, from his own experience, he should say that pallor of the skin is more common amongst women who dislike all alcoholic drinks and among men who eschew them wholly, than amongst the lovers of the glass.

After alluding to his not being able scientifically to determine the etiology and nature of the diseases treated of in this paper, and his inability to draw any inferences in an empirical manner, seeing that treatment had invariably failed, Dr. Inman compared these affections with such diseases as hepatic cirrhosis, regarding the origin and cure of which we know little or nothing. In the disease termed cirrhosis, the hepatic cells are diminished in absolute number, and the connective tissue seems to increase, and no one can understand either why the liver should contract, or what can be done to make it enlarge again. So it is with the blood in the cases of chlorosis we have been describing. The blood corpuscles diminish in quantity, and the connective tissue—in this case the liquor sanguinis—increases, and no one can explain why the former occurs, or what is to be done to prevent it. We have so long known that hob-nailed liver is an affection that is incurable, that we have ceased to feel shame at its being cited as a disease for which there is no remedy. There is, therefore, no reason why we should not consent to include in the same category the diseases we have been describing. We will not do so, however, until everything has been tried that science can suggest; and it is with the hope that others may be able to do so, or to propose some course of treatment beyond what has hitherto been tried, that he made these remarks.

Paper VIII.

On the New Pathology of Tubercle.

By Alex. Davidson, M.B.

The author commenced with some introductory remarks, contrasting the old doctrine promulgated by Laennec, with Niemeyer's new theory, and then proceeded to consider the new facts relating to tubercle and the arguments derived from them, which led to this change in opinion.

1. The facts and arguments derived from pathological anatomy.
2. Those drawn from experiments.
3. Some observations in general pathology bearing on the question.

Regarding, then, what *the study of pathological anatomy* in

recent times has taught us about tubercle. Dr. Davidson remarked that it had shown that cheesy matter does not constitute tubercle. This cheesy matter, which for a long time was considered as typically tubercular, has been found to be the result of the transformation of various pathological products, and not of tubercle alone. It might be merely inspissated pus—several examples of the contents of old abscesses, having become cheesy, had been exhibited to the society during the session. The so-called tubercle corpuscles are merely the shrivelled-up cells of the structure which has undergone this cheesy transformation—it may be tubercle, pus, or cancer—cheesy matter is not, therefore, necessarily tubercular. True tubercle often becomes cheesy, but not always. It may become fatty or calcareous.

In the next place, calcareous matter is not of necessity a result of tubercle. In the third place, scrofula is not tubercle. Scrofula and tubercle have been confounded with one another, partly because scrofula is liable to the same cheesy transformation, and so contains the same shrivelled-up corpuscles as tubercle. But Virchow has proved that while scrofula is hypertrophy of existing lymphatic glands arising from some neighbouring irritation, tubercle is a new growth, having the same histological structure as a lymphatic gland, but occurring where no gland previously existed. He classifies tubercle among the lymphomata, or tumours having the structure of a lymphatic gland. This essential character of tubercle is seen only in the early stage, when it is miliary, and before it has undergone the cheesy transformation. More recently, Dr. Burdon Sanderson has shown that this lymphoid, or as he terms it "adenoid," tissue exists normally in the parts most liable to tubercle, and that tubercle may be merely an hypertrophy of this previously existing tissue. The anatomy of tubercle being thus defined, the next point for consideration is how it originates.

Laennec's theory attributed the occurrence of tubercle to a diathetic condition of the system, which led to the spontaneous deposit of tubercle in the lungs and other organs. But recent experiments have thrown an entirely new light on the subject.

Experiments on the Inoculation of Tubercle.—A short historical

account of this branch of the subject was next given. Villemin succeeded in producing tubercle in rabbits by inoculating them with tubercular matter obtained from the human lung, and he considered tuberculosis to be a zymotic disease. Dr. Davidson detailed some experiments he had made, which were of the same character as those of Villemin, and exhibited some preparations from the animals operated on. The researches of Drs. Wilson Fox and Burdon Sanderson appear, however, to disprove Villemin's theory. These observers found that, while the inoculation of tubercular matter was the most successful means of producing tubercle in animals, still that other means, such as the inoculation of putrid muscle, or even the irritation of a seton would produce the same result. The general and microscopical characters of the indurations resulting from such inoculations were then described. It was shown that both at the site of inoculation and in the internal organs, the indurations resulted from a growth of adenoid tissue. The viscera became, however, affected by some material being taken up from the site of inoculation by the vessels, and carried through the system. Various theories had been held regarding the nature of this material. Villemin supposed it was a specific poison, like that of smallpox; and, indeed, notwithstanding the experiments of Wilson Fox and Burdon Sanderson, this view, though rendered improbable, has not been absolutely disproved, seeing that in their experiments the air was not excluded. Cohnheim considers caseous pus to be the material, while Lebert thinks it is of a chemical nature. There is not yet sufficient evidence to determine this question.

From these experiments conclusions were drawn by Dr. Davidson with regard to the contagiousness of tubercle, and with regard to the cause of the different susceptibility of animals and of individuals to tubercle. The principal conclusion, however, was that tubercle in internal organs is a secondary affection, and that a primary source of irritation exists in the body.

Lastly, how does the *general pathology of tubercle* support these conclusions. In consequence of the length to which the paper had already reached, it was impossible to discuss this part of the subject fully. Reference was made shortly to Buhl's observations

regarding acute miliary tuberculosis, and to the views of Niemeyer, Waldenberg, and Burdon Sanderson on pulmonary phthisis.

The paper concluded with the observation that the real nature of tubercle was still undecided, and that further experiments, and more accurate clinical and pathological observations of tuberculosis were still required.

Paper IX.

On Glaucoma, Primary and Secondary.

By T. Shadford Walker, M.R.C.S.E.

Previously to the invention of the ophthalmoscope by Helmholtz, in 1851, the disease now known as glaucoma was only recognised as such when it had arrived at its last, and most complete stage, that namely, in which vision was so far affected that objects could only be seen dimly in one position of the eye—the general field of vision having become greatly contracted. Nothing beyond the perception of light still remained, the pupil was seen dilated and fixed, the iris reduced to a mere ring, its colour altered, and its fibres muddy and indistinct, the lens semi-opaque, and the area of the pupil showing a greenish reflection (from which the complaint obtained its name), and the eyeball itself, when touched, being of a stony hardness. Several observers, especially Weller, Lawrence, and MacKenzie, had noted and pointed out the importance of the increased tension of the globe; but the early stages of glaucoma were confounded with the symptoms of amaurosis, and passed under that name. Soon, however, after the ophthalmoscope allowed the interior of the eye to be examined, Prof. Jaeger, of Vienna, observed, and carefully described, the appearance of the optic disc in glaucoma, drawing special attention to the typical excavation, which, from the peculiar shading of the cup, was supposed to be an elevation instead of a depression. Descriptions of the ophthalmoscopic appearances, presented by isolated cases, were also published by other observers, and the increased tension of the eyeball in glaucoma was remarked upon; but it was not until the late Prof. Von. Graefe, of Berlin, combining the observations of others with his own, demonstrated the connection between increased globe tension and the excavation of

the optic disc (the true nature of which he was the first to discover), and the consequent pulsation of the central artery, that the real pathology of glaucoma was made clear. Von Graefe, moreover, reasoning from the success he had obtained by performing iridectomy in ulceration and progressive staphyloma of the cornea (which he explained by the relief of the tension undoubtedly produced in these cases) to the great probability of a similar result in glaucoma, at length, in 1856, had the satisfaction of announcing the complete success following iridectomy in all those cases of glaucoma where delay in resorting to it had not occasioned such alterations in the structure and nutrition of the retina and optic nerve as to render operative interference of any kind of no avail. He had thus the double glory of being the first adequately to recognise the essential character of a very serious disease, and to point out a most valuable remedy, the simplicity and good effect of which have been acknowledged by the foremost oculists of all nations.

Mr. Walker having remarked that glaucoma was chiefly a disease of advanced life, and that it resembled gout, phthisis, and other constitutional disorders, in the tendencies common to them of transmission from parent to offspring, gave a careful description of Acute Inflammatory Glaucoma. A premonitory stage was recognised, in which very mild and transitory attacks passed off without apparently doing the eye much damage, but eventually, these become very frequent, leaving intervals of only a few days; the sufferer began to pass restless nights, and found no relief in his symptoms on awakening in the morning; his sight became affected, and contraction of the field of vision was observed. Then, usually at night, and accompanied by violent neuralgic pain in the forehead, the attack suddenly came on which led to the title given to this form of glaucoma of Acute Inflammatory. Rapidly increasing dimness of vision, marked dilatation of the pupil, a narrowed muddy condition of the iris, more or less turbidity of the humours, and great increase in the tension of the eyeball soon follow, and are accompanied by great constitutional disturbance. One form, coming on suddenly, and actually destroying sight within a few hours, was noticed by Von Graefe, and termed by him "Glaucoma fulminaris." Fortunately, it is of extremely rare occurrence. A

case of this kind, occurring in a working man who came to the Eye and Ear Infirmary, was described by Mr. Walker. This patient stated that two years previously, at bedtime, without any warning, the left eye was attacked; this was ushered in by excruciating pain, and in the morning vision was gone, not even a bright light held close to the eye being seen. In a similar manner, six weeks ago, the sight of the right eye had entirely disappeared within two days. No operation had been performed, and although he still suffered from attacks of dreadful pain in the eyes, he would not allow any operation to be performed.

The second variety of Primary Glaucoma, known as Chronic Inflammatory Glaucoma, was next described. It is distinguished from its predecessor mainly by having, instead of intermissions, remissions and exacerbations; rather than by the occurrence of fresh symptoms on a previously quiescent condition. Again, the cornea is much more affected in this variety; after a time it becomes flattened, and loses its sensibility to a remarkable extent, so that in many instances it may be touched or rubbed without producing any signs of distress.

A third variety exists under the name of Glaucoma Simplex, and is really only a very insidious form of the last; in which the inflammatory symptoms are masked, or are so slight and transitory, that the patient does not notice them. So quietly does the disease advance, that the sight of the one eye may be completely lost, while that of the other eye begins to fail in a similar manner, and, what was ascribed to a natural failure of sight, due to increasing years, is discovered to be disease requiring prompt measures to arrest its progress.

Having completed his sketch of the three varieties of primary glaucoma, the author made a few remarks on Secondary Glaucoma, which, as its name implies, consists of the grafting on a previous disease of the glaucomatous condition. Speaking generally, it may be said that those inflammatory diseases of the eye which, in their course, occasion an increase in the tension of the globe, and which, on subsiding, leave behind deposits of organised lymph, binding down and agglutinating the tissues, are very apt to occasion glaucoma.

In examining these classes of cases three modes of investigation must be pursued:—(1.) A careful enquiry is made into the history of the disease, and into the patient's symptoms. (2.) An ophthalmoscopic examination is made, and this, in a typical case, reveals the optic disc of a muddy, reddened, or yellowish tint, instead of showing a flat surface, being deeply excavated or cupped, the arteries smaller than natural, and exhibiting, either spontaneously or on very slight pressure, a distinctly visible pulsation, the retinal veins swollen or knotted, and very tortuous, the retina itself deprived of its transparency, becoming blurred, indistinct, and muddy, or being atrophied, and showing the choroidal pigment through its coats. (3.) Examination by the finger to determine the tension of the globe. In connection with this subject, the new ophthalmotonometer, invented by Professor Doe, of Berne, was described. It consists of a hollow ivory cylinder, containing a smaller solid ivory cylinder, the latter movable, and connected at its upper end with two upright needles, which, when pressed upon by the solid cylinder, move like the hands of a barometer along a flat metallic indicator divided into equal parts, so that when touched or pressed upon, they move until the pressure ceases, when they remain stationary, registering the pressure, which is reckoned in grammes and millimeters; the patient being laid down and the eyelids separated, the operator, by means of a silk thread, suspends the instrument by his teeth, and allows it gently to stand with its own weight on the outer side of the anterior surface of the eyeball, steadying it, but not holding it, by placing a finger against the side. The solid cylinder is allowed to project two millimeters below the level of the hollow one before being placed on the eyeball. So soon as the end of the projecting cylinder touches the globe, pressure is exerted, and the needles begin to register.

Proceeding to consider the cause of glaucoma, Mr. Walker, after mentioning the different views that had been held at various times, remarked that most probably the correct one was that held by Von Graefe, viz., that in all persons predisposed to glaucoma a rigidity and non-distensibility of the sclerotic exists, that this natural condition is increased and confirmed at the approach of

old age so that the ciliary nerves become pressed upon, their functions are interfered with, and the nutritive and absorbent action of the parts they supply becomes affected so that when slight causes of irritation arise the fluid contents of the eyeball no longer can be changed. The result is, that on the occurrence of inflammatory action no yielding of the sclerotic can take place, the products of inflammation are not absorbed, and increased tension follows. The most promising of the plans for relief at first employed, viz., paracentesis corneæ and intra-ocular myotomy have been gradually abandoned after repeated trials, and, in spite of strenuous opposition, the practice of ividectomy, first proposed by Von Graefe, has received the sanction of the foremost oculists of all countries.

The remainder of the paper was occupied with a review of the theories as to the rationale of the relief afforded by iridectomy. These all, however, tend to support the view that this operation acts by diminishing intra-ocular pressure, thus affording the restitution of conditions favourable to nutrition and circulation. Finally, Mr. Walker urged the early performance of the operation, as soon as a glaucomatous condition is fairly recognised.

Paper X.

On the Medical Control of Prostitution.

By Wm. Carter, M. B. Lond.

In this paper the writer confined himself strictly to the inquiry whether the medical control of prostitution, such as that contemplated in the Contagious Diseases Acts, 1866 and 1869, was likely to be followed by a general decrease in venereal disease, passing by any discussion of the moral aspect of the subject as unsuited to the consideration of a purely medical society. After a brief review of the circumstances which gave rise to the acts and of the provisions contained in them, Dr. Carter objected that, before any great diminution of disease could be legitimately claimed under a partial administration of a system of control, it must be proved that such diminution was general throughout the country; because as there was abundant evidence to show that some of its most immediate results were to drive prostitutes to other districts,

and to promote clandestine prostitution, it was more than likely that the greater healthfulness of one neighbourhood and class were counterbalanced by the increased disease of others.

The rational course, then, would seem to be to extend the acts throughout the country. But the objection immediately arises, that the difficulty in carrying out these provisions increases in the same, or in a greater ratio, as the increase of area and population to which they are made applicable. The example of France was especially noticed, and quotations were given from the writings of several of the supporters of government medical control in that country, to show its complete failure to eradicate the evil; and, in view of such an example, it was judged to be unwise to adopt the system here; special evidence being adduced to show that in principle that system did not differ from the one imposed by the Contagious Diseases Acts.

The paper concluded with a discussion of what were considered the very ambiguous returns forwarded to the House of Commons by the Chief Superintendent of Police, on the effects of the Acts in the English and Irish towns to which they had been applied.

Paper XI.

On some forms of Displacement of the Unimpregnated Uterus.

By J. Wallace, M. D.

This paper, revised, corrected, and greatly enlarged, will be found at p. 19.

Paper XII.

On Catheterism of the Eustachian Canal.

By R. Hibbert Taylor, M. D.

The idea of attempting to cure deafness through the medium of the Eustachian canal seems to have occurred first, said the author, to a postmaster at Versailles, named Gurgot, more than a century ago. By means of a bent sound introduced through the mouth, he at last succeeded in washing out the faucial orifice of the canal, and thus relieved his deafness. An account of this invention was submitted to the "Academy of Sciences," at Paris, in the year 1724, but it does not appear to have led to any further result.

Twenty years later, an English surgeon named Cleland, renewed the practice, and improved upon it by introducing the catheter through the nose. The instrument he employed is figured in the "Philosophical Transactions" for 1741, and resembles a small catheter pierced with lateral eyes at its distal extremity; but this would have the disadvantage of giving to any fluid injected through it a direction differing from that of the Eustachian canal. Although Cleland describes the instrument and the mode of using it, he does not say that he had employed it himself with success. The surgeons of Montpelier experimented with Cleland's instrument, but could not succeed in injecting the canal until they had made some modification in the catheter, probably by substituting a single opening at the end for the lateral eyes.

In 1755, Mr. Jonathan Walker published in the "Philosophical Transactions," a short memoir entitled, "New method proposed to restore the hearing when injured from an obstruction of the Tuba Eustachiana." Walker states that he was indebted to Mr. Jn. Douglas, the anatomist, who demonstrated in his class the possibility of passing a catheter through the nose to the Eustachian canal, for the idea which he reduced to practice in the living subject. Walker used a silver pipe, of about the size and length of a common probe, to which an ivory syringe was fitted when required. He appears to have been led to this practice from having observed at the post mortem examination of a young man who had been deaf for several years and had died of variola, that the Eustachian canals were obstructed by thick mucus, while the structure of the ears was otherwise healthy. Of six persons upon whom he operated, five were said to have derived more or less benefit. One of the instances is remarkable as the man had been deaf for eighteen years, and could only distinguish the voice of a person with whom he was familiar. After using five injections, separated by intervals of one or two days, he was able to hear the voice when moderately elevated, and could take part in an ordinary conversation provided the room was quiet.

Wood, in his treatise On diseases of the ear, narrates some striking cases in which a cure was effected from a condition of almost complete deafness. In some of these the injection was

made through the nostril into the faucial extremity of the canal, and in others the membrana tympani was perforated, and the fluid passed from without inwards towards the cavity of the tympanum. Cures resulted from both of these methods. Walker does not mention what fluid he used for injecting the ear, but we may presume it was tepid water. Itard says he employed both plain and sea water heated to the temperature of an ordinarily warm bath.

Professor Tröltsch, of Wurzburg, in his excellent work on diseases of the ear, states that he injects the Eustachian tube with air both as a means of diagnosis and of cure; and the latter injection he considers useful in clearing the canal of mucus or any other removable obstruction. He has not observed any injury to result from this treatment, but regards the benefit derived as in general only temporary. He uses the catheter for introducing wires into the ears, in the application of electricity. Tröltsch objects to the employment of liquids for injection, and uses gases only.

Toynbee recommends an instrument of his own invention, termed an "Otoscope," for diagnosing the condition of the internal ear. It consists of an elastic tube, one end of which is introduced into the ear of the patient, and the other into that of the operator, while the patient closing his mouth and nose attempts to inflate forcibly the tympanic cavity. He agrees with former authors as to the utility of injecting the Eustachian canal, but recommends caution in introducing a stream of air into the cavity of the tympanum, as fatal effects have in some instances resulted from its unskilful use.

Wilde of Dublin employs the Eustachian catheter for diagnosis when the patient is unable to inflate the membrana tympani. He does not believe that lotions or vapours, when introduced through the catheter, ever reach the cavity of the tympanum, and he has no confidence in the treatment of what is termed "Nervous Deafness," by injections of ether or anything else. Tröltsch and Wilde employ an "air-press," for injecting the Eustachian canal; a rather formidable looking condensing machine which requires the use of considerable apparatus, besides being open to other objections.

My own experience, said Dr. Taylor, although hitherto not very extensive, has led me to form a favourable opinion of injection of the Eustachian tube with air, and I should not hesitate to employ it in any instance in which the patient was unable to inflate the tympanum. I always use a catheter passed through the nostril, and blow the air into the faucial extremity of the canal. The operation is thus rendered very simple, the force of the current can be easily and surely modified according to circumstances, and the patient is free from all apprehension at the sight of much apparatus. I have not tried the injection of water or other fluid into the canal, but I see no valid objection to its employment, if conducted with caution, and it may easily be effected by means of a moderately sized syringe fitted to the wide extremity o the catheter. The difficulty of introducing the beak of the catheter with certainty into the faucial orifice of the canal is no doubt considerable, and requires both dexterity and experience ; but these obstacles are not greater than most persons can overcome with perseverance and practice.

Paper XIII.

On some of the difficulties met with in the use of the Forceps.

By Dr. Steele.

This communication was supplementary to a former paper, in which the author advocated the more frequent use of the forceps (than is generally recommended in our text books) as a means of obviating the evils resulting from the prolonged duration of labour, irrespective of physical obstruction or other complications, and in which he endeavoured to demonstrate that the instrument technically known as the long double-curved forceps was the best adapted to every description of forceps delivery, and to all stages of the progress of the head through the pelvis. The object of the present communication was to show that the difficulties met with in forceps delivery were, for the most part, attributable not to the insufficiency or imperfection of the instrument, but to the fact that from several causes, such as slight disproportion, undue projection of the sacral promontory, and other irregularities, many cases were

unsuitable for the application of the forceps, in which other modes of delivery were indicated.

[The Editors regret that circumstances prevented them more fully reporting this interesting communication.]

Pathological Specimens Exhibited.

The following table shows the various pathological preparations exhibited to the Society during the Session, arranged according to the viscera affected; while the history and characters of some of the most interesting, because rare, specimens are furnished in detail thereafter.

I. Of the Digestive Apparatus.

Stomach and œsophagus, from a case of Carbolic acid poisoning, exhibited by . . .	Dr. Cleaver.
Perforating ulcer of the duodenum, exhibited by	Mr. Barnes.
A greatly ulcerated cœcum, from a phthisical patient, exhibited by	Dr. Glynn.
Liver, undergoing fatty degeneration, and riddled with abscesses, exhibited by	Dr. Turnbull.
Liver, containing a large post-dysenteric abscess, which communicated with the right lung, exhibited by	Dr. Cameron.
Liver, with an abscess occupying the *entire* right lobe, exhibited by	Mr. Matthews.
Liver, affected with hard cancer, from a man 50 years old, exhibited by	Mr. Matthews.

II. Of the Organs of Circulation.

Heart, showing contraction of the mitral valve, exhibited by	Mr. Matthews.
Heart, showing well-marked mitral stenosis, exhibited by	Mr. Matthews.
Heart, with diseased mitral and tricuspid valves, from a boy, exhibited by	Dr. Glynn.
Heart, affected with pericarditis, from a child, exhibited by	Mr. Lough.
Heart, greatly hypertrophied, from a lunatic patient, exhibited by	Dr. Rogers.
Heart, containing a cardiac polypus, exhibited by	Dr. Wallace.
Spleen, affected with tubercle, from a phthisical patient, exhibited by	Dr. Braidwood.

Aneurism of the Aorta within the pericardium, exhibited by . . . . . Dr. Hughes.
Aneurism of the thoracic Aorta, very large, exhibited by . . . . . Mr. Banks.
Aneurism of the Superior Mesenteric Artery, exhibited by . . . . . Mr. Matthews.
Aneurism of the Abdominal Aorta, exhibited by Mr. Matthews.
Embolism of the popliteal artery, exhibited by . Mr. Geo. Walker.
Embolism of the uterine, iliac, and portal veins, causing pyœmia, and following division of the cervix uteri, exhibited by . . . . Dr. Cleaver.

III. Of the Genito-urinary Viscera.

Mamma, affected with cystic disease, and containing intra-cystic growths, exhibited by . Mr. Harrison.
Mamma, of an old man, affected with scirrhus, exhibited by . . . . . Dr. Cleaver.
Uterus, from a case of puerperal fever, exhibited by . . . . . Dr. Steele.
Ovarian cyst, exhibited by , . . . Dr. Steele.
Hydatiginous chorion, exhibited by . . . Dr. Steele.
Placenta and umbilical cord, diseased, exhibited by . . . . . Dr. Wallace.
Tubal extra-uterine gestation, exhibited by . Dr. Steele.
Penis, affected with epithelial cancer, from a man aged 26 years, exhibited by . . . Mr. McCheane.
Kidney, affected with medullary cancer, from a man aged 63 years exhibited by . . . Dr. Carter.
Kidney, showing nephropyelitis, exhibited by . Dr. Davidson.
Oxalic Acid Calculus, removed from a child's bladder, exhibited by . . . . . Dr. Rawdon.
Three Lithic Acid Calculi, removed from children, exhibited by . . . . . Dr. Rawdon.

IV. Of the Respiratory Apparatus.

Larynx, extensively ulcerated on its mucous surface, exhibited by . , . . . Dr. Carter.
Tonsils, covered with a multitude of small, peculiar masses, exhibited by . . . . Mr. Hakes.
Lung, affected with melanosis, exhibited by . Mr. Matthews.
Lung, affected with primary cancer, extending to spinal canal, exhibited by . . . . Dr. Davidson.

V. Cases of Fracture.

Ribs, fractured, some laterally, and some near their cartilages, exhibited by . . . . Dr. Cleaver.

Femur, showing impacted intracapsular fracture, from a lunatic female, aged 60 years, exhibited by . . . . . Dr. Rogers.

VI. Tumours.

Malignant tumour from the forearm, exhited by Mr. Banks.
Simple tumour from the sartorius of a boy, aged 11 years . . . . . Mr. Lough.
Large, non-malignant tumour of the lower jaw, exibited by . . . . . Mr. Harrison.
Malignant tumour, of immense size, removed from the leg, exhibited by . . . Dr. Cleaver.
Malignant tumour, implicating the inferior maxilla, and following the removal of an epithelial cancer of the lower lip, exhibited by Mr. Harrison.
General cancer of skin and internal organs of an infant, exhibited by . . . . . Dr. Davidson.
Osseous degeneration of the retina and choroid, exhibited by . . . . . Mr. T. S. Walker.
Simple tumour, of immense size, from the scrotum, exhibited by . . . . . Dr. Cleaver.

Among these various specimens, the history of the following deserve special note because of their rare occurence, or very large size.

The history of the case of *Perforating Ulcer of the Duodenum* was narrated by Mr. Barnes as follows:—The patient, æt. 39, was a gentleman of steady, active habits, who enjoyed excellent health, excepting that for some years he had been troubled after breakfast each morning with a sensation of suffocation, followed generally by vomiting, which afforded relief. This feeling was at times so severe as to cause him alarm, and was felt only after breakfast, but if he abstained for some hours from that meal, the sensation was not so painful.

On June 21st, 1870, he was suddenly seized with a feeling "as if something had given way inside him," and this was followed by a sensation of deadly faintness, with excruciating pain a little above and to the right of the umbilicus. The pain continued without intermission for many hours, his agony becoming almost unbearable. When Mr. Barnes saw the patient, almost twenty hours after the first seizure, his skin was moistened with a clammy

perspiration, and was of a dingy-blue colour; his pulse was very feeble and flickering; he lay on his back, with his left leg flexed on the abdomen, his right limb stretched straight out. His hands were thrown above his head, and grasped convulsively the bed-rail, in order to prevent, as he said, his rolling out of bed with the pain. There was no vomiting, but he experienced paroxysms of pain, and made ineffectual efforts at defœcation. Chloral was given, which relieved the pain, but the patient became drowsy, his pulse grew steadily weaker, and he died in twenty-four hours. On post-mortem examination, a small, round, thin-edged ulcer of the duodenum was found, opening into the peritoneal cavity.

The following history of *Tubal Extra-uterine Gestation* was given by Dr. Steele when he exhibited the specimen. The patient was aged thirty-five, had had two children, did not believe herself again pregnant, but had suffered for two months from hæmorrhage from the vagina. There was some fulness of the abdomen, with dulness on percussion below the umbilicus. No distinct tumour could be felt, but the uterus was enlarged. Bye and bye, rigors occurred, and were followed by severe constitutional disturbance and diarrhœa, with profuse hæmorrhage *per anum*. She was finally seized with a sudden agonising pain in the abdomen, which became rapidly and enormously distended, and she died in two hours. After death, the peritoneum, mesentery, and intestines were found covered with grumous fluid, and there was a considerable quantity of blood in the abdomen and pelvis. A portion of solid fœces, which had escaped from a small laceration in the colon near the ileocœcal valve, lay in the left iliac region. In the midst of a mass of matted tissue and coagulum, a fœtus, apparently of about the third month, was found; and near this was a mass of placental structure adherent to the flattened and hypertrophied wall of the fallopian tube, which was ruptured. The ovaries were normal.

Immense Malignant Tumour of the Leg.—The patient stated that almost twenty-four years ago she received a kick from a cow on her right leg, which did not hurt her much at the time, but the place always remained tender. Six years ago (or eighteen years after the accident) she observed a small lump, about the size of a

marble, occupying the painful spot. This increased slowly, becoming as large as a walnut in the space of three years, but not causing any pain. At that time she strained her leg so severely as to confine her to the sofa for three months. Leeches and fomentations were applied, but from that date the tumour became painful, and grew rapidly. On admission into hospital, her right leg measured 22in. in circumference. The tumour was oval, and as large as a melon, being most prominent on the inner side of the leg. It occupied the whole of the popliteal space, and extended downwards to the tendo achilles. On the outer aspect of the limb was a prominent portion, evidently containing fluid. The tumour had an elastic feel, its surface was smooth, and traversed by large veins; but there was no enlargement of the glands in the groin or elsewhere. Mr. Bickersteth amputated at the lower third of the thigh, but the patient died of pyœmia. The tumour on section had a marked cerebriform appearance, with a small mass of fibro-cartilaginous character, on its inner side. When examined with the microscope, the soft portion of the tumour was found to consist of masses of closely-packed, rapidly-proliferating cells of a highly malignant character, but the firm portion exhibited true cartilaginous cells.

A specimen of *Nephro-pyelitis* was shown by Dr. Davidson, who remarked that the patient died of dropsy, consequent on cirrhosis of the liver. His kidney was a little above the average size, and lobulated on its surface. When cut open, this kidney was found to be converted into a series of cavities, arranged after the fashion of the pyramids of Malpighi, and filled with a thick putty-like material, which, on microscopical examination, was found to consist of shrivelled-up pus cells. Originally there must have been nephropyelitis or suppurative general inflammation of the whole renal tissues. The corresponding ureter was thickened and impervious. This form of disease is described, said Dr. Davidson, by Bailey, and even by Wilks, as a scrofulous affection, but is rather to be regarded as a chronic abscess, the purulent contents of which have become inspissated. The left kidney appeared healthy on section, but enlarged to three times its normal size.

Dr. Davidson showed a specimen of a *subcutaneous tumour*,

removed from an infant four months' old. It somewhat resembled a large carbuncle, and was situated over the hip, but on section it proved to be a true scirrhous cancer. There were several others similar to it on the back and legs, besides numerous nodules varying in size from that of a pea to that of a filbert, all over the body. The left lung was filled with cancerous nodules, and the left costal pleura was lined with a continuous mass of hard cancer. When the child was born he was covered with blebs, and with structures like minute noevi, which bled easily, giving the child the appearance of being covered with a congenital syphilitic eruption. It was considered to be such, and the child treated accordingly. After a time, many of the little tumours disappeared, and the child throve till last month matters altered, and fresh tumours sprang up. There was no history whatever of syphilis; and the case was one of true cancer, though there was no trace of its being hereditary.

An example of *Soft Cancer of the Lung* was also exhibited by Dr. Davidson. The preparation had been removed from the body of a young woman, who died in the Royal Infirmary four days after her admission. She came in with symptoms of lung disease, in many respects closely simulating phthisis of one lung, and which had existed for a considerable period. She suffered also from complete paraplegia, with anœsthesia, reaching up nearly to the armpits, which had commenced three or four weeks before her admission—beginning in the feet, but gradually and steadily passing upwards. Her urine and motions were passed in bed, and a large sloughing bedsore existed over the sacrum. Paraplegia being the disease which terminated life, the spinal cord was carefully examined at the autopsy, the theca of the cord having been punctured accidentally, about half-an-ounce of serum escaped. In cutting through the vertebral laminæ, at a point nearly opposite the second dorsal vertebra, a yellowish mass, of about the size of a large bean, was divided. It seemed to spring from the inner aspect of the right lamina of the vertebra to which it belonged, and projected into the canal, pressing upon the cord. It very closely resembled a portion of the soft, light-yellow fat which forms little masses within the spinal canal. On examining the cord there was found,

at a point about an inch below this mass, a portion of the nervous tissue undergoing white softening, not very advanced, but quite recognisable by the naked eye. The mass above-mentioned adhered firmly to the dura mater, and was, therefore, torn through in removing the cord. Its nature was explained on opening the thorax, when it was discovered that the right lung was the subject of soft cancer diffused through its centre. There were a few cancerous nodules on the pleural surface, but none in any other part of the body, except in the bronchial lymphatic glands. This appeared, then, to be primarily a case of cancer of the lung. On careful examination this cancerous infiltration was found to have passed backwards along the posterior aspect of the chest, creeping along the periosteum of the vertebra, but not attacking the bones. It then reached the spinal canal, where it had, so to speak, "fungated" out into the little mass which pressed on the cord. It had crept through between the vertebral laminæ.

Mr. George Walker exhibited the heart and popliteal artery of a patient, in whom an *Embolus had been propelled from the aortic valve into the left popliteal artery.* He stated that R. F., æt. 34, had been extremely dissipated till within the last year or two of his life. Shortly before his death he was under treatment in a hospital on account of epistaxis and hæmorrhage from the bowel. The bleeding was relieved by the removal of hæmorrhoids, but the epistaxis persisted. He also had purpura. Mr. Walker saw him about a fortnight after he came out of hospital. He had been a very powerful man, but was now greatly emaciated. Purpuric spots were scattered over the trunk and lower limbs. The eye was at once struck with an extraordinary pulsation in the arteries—the carotids seeming to leap out of their beds, while arteries, whose pulsation under ordinary conditions could not be detected, now gave the beat of a normal radial. The patient was little conscious of this condition, and complained only of slight cardiac palpitation. He suffered most from severe pain in the left calf, which had commenced gradually during the previous night, and was accompanied by numbness and coldness in the corresponding foot. Mr. W. found the left leg cold to the touch, the left posterior tibial could not be felt, and the dorsalis pedis only very faintly. On the

sound (right) limb these arteries, and also the anterior tibial, as far as its origin, could not only be felt, but seen. The left femoral artery was as distinct as the right one, as far as the opening in the adductor, but below that point the left popliteal pulsated very feebly. Pressure over the lower part of the popliteal region caused great pain, and the artery near its terminal bifurcation was not so compressible as the right one. There was no swelling, but a slight diminution of sensibility in the left foot. The cardiac impulse was perceptible over a considerable area.

By the use of suitable remedies the patient's symptoms were relieved. The dorsalis pedis pulsated more gently, and a large artery could now be seen branching off from the terminus of the femoral, passing down by the side of the tendon of the adductor magnus muscle over the inner condyles of the femur and tibia, and thence crossing the latter bone about the middle of the leg. Another artery could be felt crossing the patella; while a third ran along its outer side. The purpura and epistaxis had now disappeared, and the circulation generally was quieter. Very soon, however, considerable inflammatory thickening was detectable along the lower end of the left popliteal artery. The dorsalis pedis could still be felt pulsating feebly, but this ceased entirely in another week. The patient's general health continued, however, to improve, and he began to move about, complaining only of the foot being very cold.

On Dec. 26th, 1870, after exposure to cold, his legs became œdematous; albumen and small tube casts appeared in his urine; pneumonia soon set in, and he died in ten days thereafter.

Autopsy.—The spleen was much enlarged. The kidneys were enlarged, and their cut surfaces swollen from recent exudation. The lungs were found healthy, except at the lower part of the right middle lobe, which was congested and impervious to air throughout a well-defined area. No embolus could be found in the artery supplying this part.

The heart was much enlarged, especially its left half. The right auricle was filled with its usual venous clot. In the right ventricle was observed a partly decolorised clot, enlaced closely among the papillary muscles and tendons, and extending along the pulmonary

artery to its bifurcation. In the left ventricle was a similar clot, but larger, which extended into the subclavian and carotid arteries, and for some distance along the descending aorta. A tenacious coloured clot was applied to the anterior surface of this older one, but could be peeled off it intact. The anterior and posterior segments of the aortic valves were each perforated by an aperture about one quarter of an inch in diameter, and their edges were fringed with a thick and irregular mass. The third or right segment could close, but from its centre projected a roughly pyramidal mass of cheesy-looking matter, terminating in a cretaceous point which, when the valves met, fitted into the apertures in the other segments. In the left popliteal artery was found a mass of the same character as those observed on the aortic valves, partly of cheesy consistence, but with some gritty spots. The vessel was completely plugged, but although the vein was adherent to the artery, and the surrounding tissues were all matted together with lymph, there was no sign of endo-arteritis properly so-called, and only a thin delicate clot on the cardiac side of the embolus. Mr. Walker remarked that he believed that in this case there had taken place simultaneously an atheromatous and a calcareous degeneration, as also an actual growth of lowly-organised tissue leading to the destruction of the larger part of two segments of the aortic valves and to the embolism.

Dr. Cleaver showed an immense *Tumour of the Scrotum* removed by Mr. Bickersteth from a patient in the Infirmary. The patient was almost forty-six years old, and he noticed a lump about the size of a marble in his left groin seventeen years ago. One day it slipped down rather suddenly into the scrotum, but he replaced it. It fell again, however, and remained in the scrotum where it steadily grew till it was nearly the size of a head. The skin and subcutaneous textures gradually assumed an hypertrophied action, so that the whole scrotum formed a tumour reaching to below the knees when the patient was in the erect posture. Being a tailor, he was able to pursue his occupation without much distress, and he seldom if ever went out. His sexual appetite was not affected, and the tumour caused no pain. The testicles lay in front of the tumour, but the penis was entirely buried in the mass, its site

being marked by an umbilical-like depression. Mr. Bickersteth commenced operating by making two incisions along the line of the spermatic cords, tracing them down till the testes were reached and then extracting these from the tunicæ vaginales. The penis was next dissected out, and lastly the root of the tumour, along which its bloodvessels entered, was reached and ligatured. With a few sweeps of the knife the tumour and hypertrophied skin were carried off, enough skin being left to cover in the testes.

Mr. Matthews exhibited an *Aneurism of the Superior Mesenteric Artery* removed from a patient in the Royal Infirmary, who died in a few hours after admission. He had been a topsawyer, and in the habit of constantly bending backwards and forwards. He had suffered from sickness, vomiting, and epigastric pain for some months, and the presence of a swelling in the region of the stomach could be traced back for four months. The tumour pressed on the gall-duct, and had formed a large sloughing ulcer of the duodenum.

COMMUNICATIONS.

1. Dr. Carter showed the new substance *chlor-alum*, which has been lately brought under the notice of the profession by Mr. Gamgee, as a disinfectant. Among its advantages are these, that it is not poisonous, and that the results of its disintegration are good as disinfecting agents and destroyers of bad smells. It is formed from chloride of calcium and sulphate of alumina. A complete decomposition results, and the chlor-alum can be obtained of perfectly regulable strength. Dr. Carter thought that in certain of its effects it resembled those substances used in dyeing, termed mordants, and which are used for the purpose of precipitating colouring matters on cloth, and then fixing them. It is eminently preservative of animal tissues, and not corrosive. Dr. Carter narrated the case of a male patient with hemiplegia, whose urine became so exceedingly offensive as to render the air of the apartment in which he lay almost unbearable. Dr. C. thought to inject a dilute solution of chlor-alum into his bladder, but most fortunately before doing so, he added a little of the solution to some urine which the patient had passed, and found that it caused the

urine to become semi-solid; what might have been a serious accident was thus avoided. Dr. C., however, had this disinfectant applied all about the patient's person and in his bedroom, with marked improvement in the atmosphere of the chamber.

2. Dr. Carter exhibited a simple, but effective apparatus for *testing the amount of air either inspired or expired.* It consisted of a tube graduated to known measurements on the outside. This was placed in a vessel containing coloured water, which ran up it when the air was exhausted by means of a small tube passing up its centre, and connected with the mouth. When air was inspired the coloured fluid at once fell. The extent to which the coloured fluid rose and fell, as marked by the graduated scale on the outside of the glass tube, indicated the amount of air expired or inspired.

3. Dr. Dale communicated the case of Master O., who was seized with scarlet fever on April 11th. On April 29th there was slight swelling in the neck; on May 1st he had general anasarca, with albuminous urine; on the 4th he had a short, dry cough and sneezing; on the 5th his cough continued, but the œdema began to subside. Measles became fully developed on May 6th, and all the swelling disappeared; by the 9th the eruption of measles had passed off, but the dropsy began to return. On May 10th the child was nearly in the same condition as on May 1st. The dropsy then began to yield to treatment; and by May 19th the lad was quite well.

Dr. Dale also communicated the case of Master B., who was seized with scarlet fever on July 22nd. On August 7th his sister, who had been much with him, and was fifteen years old, exhibited the same disease, which was, however, confined exclusively to the left half of the body, the left tonsil, and the left half of the tongue presenting the characteristic scarlatinal appearance, and the rash being developed on the same side only. Desquamation was also confined exclusively to the left side. She had always been a strong, healthy girl, and never had exhibited any signs of debility or loss of nervous power on either side.

4. Mr. Edgar Browne read a "Note on Hydroa." Hydroa, he said, is a word not used by systematic writers in England, but it

has been occasionally employed as synonymous with herpes labialis and miliaria. It has recently been adopted by Bazin to designate a disease hitherto not classified, and a brief report in the *British Medical Journal* has drawn the attention of the profession in this country to the affection.

The disease described as Hydroa approaches in its clinical characters to an erythema and a herpes. Like the one, it is uncertain in its duration—sometimes fugitive, sometimes persistent, uncertain in its selection of a seat, but by preference symmetrical, and most frequently attacking the face and extremities; though resembling the other in the development of vesicles, or small bullæ, and in having a spontaneous subsidence.

M. Bazin recognises three varieties — *Hydroa vesiculeux*, *Hydroa vacciniforme*, and *Hydroa bulleux*, and he includes all these in the catalogue of arthritic maladies. Vesicular hydroa attacks the skin and mucous membrane, choosing generally those parts of the one which are habitually uncovered, and of the other the inside of the cheeks, lower lip, and fauces. The affection is preceded by malaise, anorexia, and slight pyrexia; but these symptoms might be absent, or so slight as to escape notice. The eruption consists essentially of small, light-red or pink patches, varying in size from that of a lentil to that of a shilling. On the second day a central vesicle appears; this dries rapidly, and forms a light crust in the centre, while the fluid at the circumference seems to be re-absorbed. In the course of a few days, the crust falls, and leaves a slight discoloration, which is only slowly effaced. The duration of the attack may be from two to four days, the eruption appearing in crops, which occupy four or five days in evolution.

The vacciniform variety is simply the same disease, with a tendency to produce a seropurulent secretion, and is of greater chronicity.

The bullous variety resembles pemphigus, but is easily, if not spontaneously, curable at the end of three to six months. The bullæ are irregular in shape, but never attain a greater size than that of an ordinary pea.

The author related three cases—one, in which a well-marked

eruption appeared, copiously on the arms and forearms, but sparsely on the trunk, of a healthy young woman after parturition. Its duration was nearly five weeks, and it left for some time afterwards a reddish-brown stain, and a sense of burning and itching. The case had been supposed to be "shingles;" but the irregular distribution of the vesicles, their separate red bases, their aggregation in the forearm, where *zoster* never occurs, the bilaterism, and absence of neuralgia, constitute important differences.

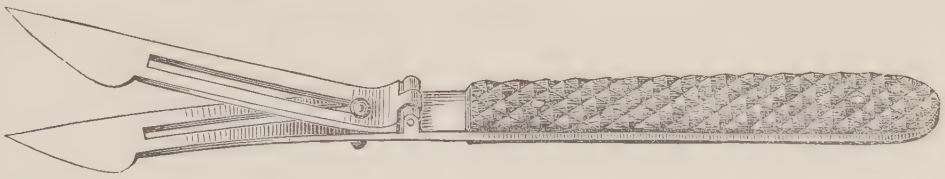
In a second case, the eruption appeared chiefly on the anterior aspect of both arms and forearms, lasted for six weeks, left stains, and was exceedingly irritable, but was not accompanied by neuralgia, joint affection, or constitutional disturbance.

In a third instance, a girl, aged seven years, frontal neuralgia, with amaurosis of the right eye (O. S. normal), preceded by two days an eruption on the back of the neck and shoulder, which was more developed on the right than on the left side. On the eighth day, a typical eruption of erythema nodosum was noticed on both legs, and constitutional disturbance was manifest. The right eye was attacked with phlyctenular ophthalmia. At the end of two months and a half, no eruption was present, neuralgic pains were occasionally felt, and vision remained imperfect. In this remarkable case, we saw erythema with herpetiform eruption in one part of the body, erythema nodosum in another, and neuralgia, with functional disturbance, in another. It resembles, but is less severe than, an instance of erythema nodosum, with a vesicular eruption on the face, neck, arms, and legs, along with phlyctenulæ on the right conjunctiva, reported by Mr. J. Hutchinson.

The above cases (with others reported) seem to show that we must recognise a variety of disease evidently closely allied to erythema, but, in many respects, resembling herpes—apparently not connected with any special zymotic poison of its own, nor with that of the recognised exanthems, nor with syphilis, nor, so far as the cases recorded enable us to judge, with any particular diathesis or state of health. It may possibly prove to be the missing link between diseases at present considered as not related to each other.

5. Dr. Braidwood showed a *new form of Vaccinator*, resembling the Danish one, only made like Valentin's Knife, with

separable blades, admitting of its being readily and thoroughly cleaned. In using this vaccinator, the blades having been closely approximated, the instrument, held like a pen between the thumb and forefinger, is dipped in the lymph, and takes it up as a pen does ink; an incision being then made, the lymph flows into it. The accompanying woodcut represents the size and shape of the instrument. The advantages of vaccinating with this form of vaccinator are rapidity and painlessness, while the result is as certain as by any other method.*



6. Dr. Lyster exhibited the *Pneumatic Aspirator*, which is fully described at p. 79 of this Journal.

7. Dr. Turnbull made some interesting observations on a case of *Idiopathic Anæmia*, in a male patient who had died in his wards. The patient had gradually sunk, without having exhibited any symptom pointing to disease of any special organ. Great general pallor and loss of strength were the marked features of the case, and these had been coming on for a considerable time. His blood was examined during life by Dr. Davidson, who reported that while there appeared to be no absolute increase in the number of the white corpuscles, there was a decided diminution of the red, which were also badly formed. All the viscera were found after death to be extremely bloodless, but actual disease was observed only in the following, viz., the heart, which was very flabby and soft, and, when examined microscopically by Dr. Davidson, was discovered to be in a highly advanced stage of fatty degeneration; the liver, which was somewhat enlarged, and also fatty; the right kidney, which was much smaller than normal, and granular on the surface, while its cortical substance was very much diminished in amount. It may be further stated that the spleen was much smaller than usual, and the left kidney, apparently compensating for the right one, was abnormally large.

* This Vaccinator is made by Messrs. Maw, Sons, and Thompson, 12, Aldersgate Street, London.

Dr. Turnbull, after drawing attention to the patient's symptoms, remarked on the perfect inutility of any of the ordinary remedies for anœmia, all of which had been tried in this case; and he showed how iron, an almost certain cure for certain forms of this disease, was in this instance quite useless. He referred to Dr. Inman's paper on "Male Chlorosis," some of the cases described in which exactly resembled this one. Finally, he remarked that considerable speculation might occur as to whether the fatty condition of the heart and liver formed in this instance the primary disease, leading to an enfeebled circulation, and so to an imperfect power of forming good blood; or whether the first lesion was not of some obscure nervous nature primarily affecting the blood-forming process, so that the viscera, from being badly nourished, lapsed into the fatty condition found after death.

8. Dr. Glynn exhibited a very ingenious *Ophthalmoscope*, with tube, lamp, and reflector in one, so constructed that there was no occasion to put the patient in a dark room. This instrument, and its mode of application, is fully described by Dr. Glynn at p. 113.

9. Dr. Davidson read a short communication advocating the *the use of Pepsine Wine* in those forms of diarrhœa in infants marked by the food passing almost unaltered through the bowels; and gave examples of its use.

10. Mr. Edgar Browne showed a pair of socks, which had caused a month of suffering to a gentleman. They had alternate light and dark stripes; the latter were of two kinds, one purple, and one somewhat yellow. Dr. J. Campbell Brown had found that the purple stripes were dyed with *azuline*, and the yellow ones with *peonine;* but he could not say which was the poisonous dye. The patient had danced in tight boots with these socks on, and the skin had then inflamed in lines corresponding to the stripes. Bullæ formed, and became confluent, spreading over the healthy interstices between the inflamed lines, till the leg had the appearance of having been blistered. Mr. E. Browne explained how sundry errors had been made in performing experiments with poisonously dyed cloths, by the experimenter wearing portions of them on such a part as the arm. No effect was often produced; whereas it was clear, that, for the liberation of the poisonous

material and its absorption, the skin must be thoroughly moistened, and the cloth be closely applied. These conditions were, in this case, exactly fulfilled, by the patient dancing in these socks and tight fitting boots.

TRANSACTIONS OF THE MICROSCOPICAL SECTION OF THE LIVERPOOL MEDICAL INSTITUTION.

SESSION 1870—71.

Communicated by Isaiah de Zouche, M.D., *Honorary Secretary.*

First Meeting, Oct. 21*st,* 1870.

Dr. Waters in the Chair.

Dr. Waters made some introductory remarks on the use of the microscope in medicine and surgery, and afterwards read a paper "On the Intimate Structure and the Morbid Anatomy of the Human Lung," which he illustrated by numerous microscopical specimens.

Second Meeting, Nov. 18*th,* 1870.

Mr. Hamilton in the Chair.

Dr. Braidwood read "Original Observations on the Microscopy of Vaccine Lymph."

The author stated that the most important elements discovered in vaccine lymph by means of the microscope were — very delicate fibres, no doubt a variety of fibrinous deposit; extremely minute, spherical, highly refracting particles, which were most abundant in recent lymph, and which Dr. B. believed to be vaccine germs; and red blood corpuscles. The examinations of vaccine on which these observations were based were made with $\frac{1}{1\frac{1}{2}}$ inch objective lens.

The vaccine germs are met with in *all* specimens of vaccine lymph, and are most abundant in recent lymph. They are most distinctly seen in lymph which has been allowed to dry on the glass slide, and in lymph acted on by ether. In recently removed lymph, they are observed to aggregate in twos, threes, or fours; and sometimes present molecular movements, but exhibit no other sign of life. They are unaffected by reagents.

The next most common ingredients of vaccine lymph are the red blood corpucles, which are met with in ninety-five per cent. of specimens of vaccine. Dr. B. remarked that he had found the largest number of blood corpuscles in lymph collected by most experienced vaccinators, although the lymph to the naked eye appeared to be free from blood. In the fluid forms of vaccine lymph they are readily distinguished; but in these, and still more frequently in dried lymph, they often present very contorted forms.

We meet, thirdly, with very delicate fibres. These are extremely fine, transparent, and granular. They resemble very closely the molecular fibres obtainable from ordinary blood coagula. They are seen only in lymph which has been preserved in the fluid state, and only when lymph has been thus stored up for some time. To the naked eye they appear as a whitish coil, in the centre of a drop of lymph. They seem to be dissolved by dilute acetic acid, and by ether.

In addition to these elements of vaccine lymph, we find in this fluid sometimes epithelial cells, phosphatic crystals, when the fluid has been long preserved in the fluid state, occasionally crystals of cholesterine, and in *very* old lymph fungoid structures are met with. Granules, and amorphous bodies, which may be included under the term debris, are generally found in specimens of fluid vaccine, and are probably derived from the impure interior of the capillary tube in which the lymph has been preserved. Occasionally, pus corpuscles are found in vaccine, indicating that the lymph has been removed at too late a date.

Dr. Braidwood stated that his observations were based on the examination of over one hundred specimens of vaccine lymph, collected by himself and by others, and preserved in various ways, and he concluded with a short account of the action of various reagents on vaccine lymph.

Mr. Newton showed a specimen of Tænia Acanthotrias.

Third Meeting, Dec. 16th, 1870.

Dr. WHITTLE in the Chair.

Dr. Caton read a paper "On Pigment in Animals," consisting

of a brief description of the physiology and pathology of those coloring matters which can he examined microscopically.

I. Under the head of Physiology, were considered the situations and visible characters of pigments in the various classes of the animal kingdom, and its relation in man, specially to age, sex, character, and habits of life. The importance of sunlight and heat, and probably also of a carbonaceous diet, were pointed out as favoring the development of colour; the spontaneous movements of pigment cells and granules existing in many animals; and, lastly, the general and special functions of pigment, were described.

II. Under the head of Pathology, were described the increase of pigment in the skin in Addison's disease, melasma, cyanopathia, and melanæmia; the partial connection of these diseases with the formation of free pigment granules in the hepatic and splenic veins, the increase of pigment in the brain in insanity, morbid stearrhœal pigment, anthracosis, melanotic tumors, and the local deposits of pigment which succeed inflammation, many of these diseases being probably compensatory for diminished excretion of carbon. The paper concluded with a notice of the morbid diminution of the coloring matter in albinism, leucopathia, &c. Specimens were exhibited, illustrating the pigment cells of the various classes of animals, the deposits in the skin, brain, &c., of man, and the chief morbid conditions described in the paper.

Fourth Meeting, Feb. 24th, 1871.

Dr. Waters in the Chair.

Mr. Newton exhibited a Gründlach's $\frac{1}{1\frac{1}{2}}$ inch objective, costing $3\frac{1}{2}$ guineas.

Mr. Hamilton showed specimens of the lymph of small-pox and chicken-pox; also of vaccination and re-vaccination, taken at various stages; and remarked on their peculiarities.

Dr. de Zouche read a paper on "Oxaluria."

He mentioned especially two instances, as examples of this affection. One, a case of debility following rheumatism; the other, a case of spermatorrhœa. In both of these, oxalate of lime was found in the urine during several weeks. He referred to the difficulty of determining the amount of oxalate of lime in the urine,

which might be considered indicative of disease; and, on the other hand, its very frequent occurrence in conditions of mal-assimilation, as in convalescence from acute diseases, when the assimilative functions are still imperfectly performed; in dyspepsia, scrofula, and many other diseases. Its presence in cases of spermatorrhœa, attributed by some to the fact that oxalic acid is found in the spermatic fluid, is explicable also by the general nervous debility and disinclination to take exercise which characterise this affection. The intimate connection between the oxalic and uric diatheses, and their alternation in the same individual, notwithstanding the presence of nitrogen in uric acid, was pointed out; also the surgical interest of oxaluria, from the formation of vesical calculi of oxalate of lime.

He briefly referred to the treatment of oxaluria, which should be directed to the cause of the affection. Dyspepsia should be treated by careful dieting, and medicinally the nitro-hydrochloric acid is found to be one of the most useful remedies. Moderate exercise is to be recommended, and a healthy action of the skin maintained.

Fifth Meeting, March 24th, 1871.

Dr. Waters in the Chair.

Mr. Newton read a paper "On the Illumination of Objects for the Microscope."

Mr. Newton dwelt on the great importance of the subject, asserting that an observer who is thoroughly acquainted with the best modes of lighting the object will be able to show far more and better with an inferior instrument, than another who is ignorant of the subject can do with a better and more expensive microscope. He enumerated the various sources of light usually employed, as day light, oil lamps, camphine and paraffine lamps, and coal gas burners. He showed the various modes of directing and concentrating these sources of light, as Amicis and Reade's prisms, the parabolic illuminator, the concave and plane mirrors, Ross and Swift's achromatic condensers, the use of diaphragms, stops, &c. Also the modes of illuminating opaque objects by the Lieberkuhn and side reflectors, and the bull's eye condenser. He pointed out the evils of excess of light at various angles falling on

the object at once, and explained that rays parallel, or nearly so, were the best ; and that the smaller the illuminating pencil, so long as it was sufficient for the purpose, the clearer the image. He also dwelt on the superiority of oblique lighting from one direction, which was illustrated by Nobert's test plate, containing nineteen bands of lines from $\frac{1}{11000}$th to $\frac{1}{112000}$th inch asunder, all ruled within the width of a horsehair. This was exhibited under Powell and Lealand's $\frac{1}{20}$th immersion object glass. He exhibited also both transparent and opaque objects under various modes of illumination.

Sixth Meeting, May 19th, 1871.

Dr. WATERS in the Chair.

Mr. Harrison gave the particulars of a case, in which uric acid was passed from the bowels.

Mr. Hamilton described a case of disease of the skull, in which a peculiar deposit filled up the excavated portion of bone.

Mr. T. S. Walker exhibited microscopical sections of a specimen of osseous degeneration of the retina, the result of inflammation of the eyeball, from injury caused by a sharp piece of wood striking the globe.

After the business proper at each of these meetings was discussed, the members examined numerous objects of medical interest, placed under a number of microscopes in an adjoining room.

ABSTRACT OF THE PROCEEDINGS OF THE LIVERPOOL NORTHERN MEDICAL SOCIETY FOR 1870.

I.—*Pathological Specimens Exhibited.*

By Dr. Nottingham.

1. *A large benign Tumour*—recently removed from the abdominal parietes.

2. *The brain* of a man who had died from concussion. The left side was congested, and blood effused on its surface; the left lateral ventricle contained a large clot, and on the surface of the dura mater of the same side was also a large clot. The deceased had been a cab-driver, and fell off the box of his car, landing on his occiput. He walked to the Southern Hospital after the accident. Externally there was a small scalp wound in the occipital region. He was fifty-three years old.

3. *Heart in a case of Sudden Death.*—The deceased, a man thirty-five years of age, died suddenly, after arriving home from sea. He walked home, complained of feeling sick, and died in about two hours. He was supposed to have been in good health prior to this. The heart was found very much enlarged, weighing $1\frac{3}{4}$lbs.; the lungs were congested, and the brain shrunken.

4. *Abdominal Tumour*—from a woman upon whom ovariotomy had been performed two years previously.

5. *Fracture of the Fourth Cervical Vertebra.*—A man, aged thirty years, was admitted into the Southern Hospital on account of an injury of the neck. He died ten days after admission, while returning from the water-closet. The right transverse process of the fourth cervical vertebra was found to be fractured. It was suggested that the straining during defœcation might have caused the fractured process to impinge on the phrenic nerve, and so induced death.

By Mr. Harris.

1. *A small Fibrous Tumour*—from the leg. It was situated between the external malleolus and the tendo achilles, and occasioned great pain throughout the limb, up to the hip, interfering greatly with progression. The removal of the tumour, which was no larger than a pea, relieved the patient of all her symptoms.

2. *Mammary Tumours.*—The first specimen shown was about the size of a marble, hard, and apparently cartilaginous. It was first noticed four months prior to its removal, was moveable, and situated external to the nipple. The patient was a married woman, thirty-three years old.

The second specimen was about the size of an orange, was more indurated in its centre, appeared striated on section, and, although it had not been examined microscopically, it presented a suspicious character. The patient was thirty years old, and not married. The tumour was first noticed fourteen months prior to the operation.

3. *A Needle*—two inches long, which Mr. H. had removed from a child six months old. It lay transversely among the abdominal muscles, and gave rise to distressing symptoms, which were at once relieved by its removal. There was no history to show how long it had been retained, but it must have been below the skin for a considerable time, as a swelling, about the size of a hazel nut, surrounded it.

4. *A large Warty Growth*—of the size and appearance of a cauliflower, removed from a young man, twenty-seven years old. It was situated over the left sacro-iliac synchondrosis, and was supposed to have existed since birth.

5. *Two Uterine Tumours*—Mr. H. had recently removed. The first was about the size of a walnut, of a fibroid character, and had existed in the uterus of a woman, thirty years of age, who had borne children. There was the usual history of severe hæmorrhages, &c. It was removed by means of the ecraseur, and a good recovery followed.

The second tumour was about the size of a small placenta, and had been forced down into the vagina during defœcation. It was removed by ligature, and the patient did well.

By Mr. Parker.

1. *Caries of Vertebræ.*—The disease had existed in a boy, causing angular curvature, and affected the sixth and seventh dorsal vertebræ. An abscess formed, which was eventually opened, and its cavity injected with carbolic acid lotion. The case terminated unfavourably.

2. *Cardiac Inflammation.*—The subject was a boy, fourteen years of age. There were many evidences of endocarditic depositions, and the pericardium was so adherent as to defy separation from the substance of the heart without destroying its structure. The disease commenced with articular rheumatism of the knee, which was relieved by the use of perchloride of iron; dyspnœa ensued after a while; an endocardiac bruit was detected, and a peculiar tumultuous sound in the precordial region. Death took place in four weeks from the commencement of the attack.

3. *Rupture of the Cœcum.*—The deceased was a boy, aged ten years, much emaciated, and who had complained of pain in the stomach, and faintness. During life there was observed a swelling in the right renal region, and peritoneal tenderness. Cod liver oil and a liberal diet was ordered, but no evidence of tubercular disease could be found. Shortly before death, the tumefaction disappeared. At the autopsy the cœcum was found to be ruptured, while the peritoneum and the abdominal walls below the umbilicus were filled with a creamy fluid. Some potato skins were discovered in the cœcum, and an almost impervious stricture in the commencement of the ascending colon.

By Mr. E. Grattan.

An Anencephalous Fœtus.—The parietal bones, the squamous portion of the temporals, the frontal above the superciliary ridges, and the occipital bone above the inferior ridge, were absent. The brain substance was wanting. At about the fifth month of gestation, the mother had received severe injuries from her husband.

By Dr. M. Hill.

Aortic Aneurism.—The aneurism proceeded from the arch of

the aorta, and opened into the left bronchus. The absence of stethoscopic signs had prevented the diagnosis of the lesion during life.

By Mr. J. W. Irvine.

1. *Os Calcis*—of a boy, seventeen years old, which had been removed three weeks previously. The lad had suffered from disease of this bone for nine years, and had been subjected to repeated gougings, which afforded only temporary relief. In excising the os calcis, the usual incisions for Pirogoff's amputation were made. The patient made a good recovery.

2. *Diseased Bone removed in excision of the Elbow Joint.*—The articular cartilage of the radius, and the ends of the ulna and humerus, were removed, while about two inches of the latter bone, being diseased on its outer aspect only, were removed. The diseased condition is ascribed to a blow from a hammer, received nine months previously. The case is doing well.

3. *Diseased Femur*—removed by Mr. I. by amputation through the hip joint. Excision of the knee had been previously performed, but the patient was a strumous subject. He is making a good recovery.

By Mr. Hanbury.

Autopsy on one of the St. Joseph's Chapel victims.—Regarding the sufferers from the crush at the St. Joseph's Chapel, Mr. Hanbury stated that, of those who had survived their injuries, only one sustained fracture of any bones, five were removed to hospital, five walked home, two had convulsions, and one delirium, while fourteen were found dead; but in only one case was a *post mortem* examination ordered. The aspect of nearly all of those who were killed was calm. The subject of autopsy was sixty years of age; the face was livid, five ribs on the left side were fractured, and two on the right side; blood was found effused beneath the scalp, and on the dura mater; the lungs were congested; the heart, slightly fatty, contained a small clot in its right ventricle. Mr. Hanbury states further that a great number had, since the accident, called at the East Dispensary, suffering from nervous derangement, in conse-

quence of the shock sustained by having been present during the excitement.

By Dr. A. C. Hughes.

Aortic Aneurisms—from a man, thirty-two years, who had died suddenly. Three aneurismal saccules were found in the aortic zone. One of these had given way, and the pericardium was found filled with blood. Atheromatous deposits were seen on the valves and lining membrane of the aorta. A large amount of fat surrounded the base of the heart. The diseased condition had not been discovered during life.

By Mr. H. Samuels.

1. *Malignant Stricture of the Œsophagus*—from a woman, twenty-seven years old.

2. *Malignant Disease of the Omentum and small Intestines*—from a woman, aged forty-seven. There was a completely impervious stricture of the ileum near the cœcum. Immediately behind the stricture in the ileum, an orange pip was found.

3. *Aortic Disease.*—The subject was a man, sixty-five years old, who had had rheumatic fever forty years previously, but who had since enjoyed good health. He died of dropsy, but there was scarcely any bruit audible during life. After death, a considerable amount of thickening and atheromatous deposit were found on the aortic valves.

II.—*Cases Related or Exhibited.*

By. Dr. Wiglesworth.

A Case of Delirium Tremens—successfully treated by hydrate of chloral. In the course of his remarks, Dr. W. alluded to a train of symptoms, first noticed, he believed, by the late Dr. Arnold, of this town, as the result of beer drinking, and found principally among the poorer classes, viz., tingling in the lower limbs, pain, and heat of the legs. Dr. W. considers chloral possesses advantages over all other remedies in delirium tremens; and that, in suitable cases, its use is free from danger.

Two Cases of Retained Pessaries.—One of these, an ordinary

wooden ball-pessary, perforated through its centre, had been in the vagina eight months, and had lost its tape. All ordinary means of removal proving futile, the patient, aged sixty-four years, suggested the employment of a corkscrew. When the aperture in the pessary was found, the corkscrew was introduced into it, and fastened by a few turns of the screw, and, after severe traction, the pessary was removed, still attached to the corkscrew.

By Dr. Nottingham.

Case of Strangulated Hernia.—The patient was thirty-five years old; the hernia was of many years' duration; the tumour about the size of a child's head; the ordinary constitutional symptoms, which indicate the necessity for operative procedure, were almost entirely absent; yet about thirty inches of dark intestine, and an undescended testicle, were discovered outside the internal abdominal ring. No adhesions existed, the bowel was returned easily, the testicle was left in the lower part of the scrotum, and the patient made an excellent recovery.

By Dr. Charles Hill.

Cases of Eating Castor Oil Seeds.—A woman, having eaten seven such seeds, suffered from severe vomiting and diarrhœa. —the symptoms resembling those of cholera; but she soon recovered. A child ate six of these seeds, and exhibited no bad effects therefrom.

By Mr. Harris.

Case of Spina Bifida—in a healthy, well-nourished child, twelve months old. The mother stated that the tumour, which appeared to emanate from the last cervical and first dorsal vertebra, was about the size of a duck's egg, at birth. Having punctured the swelling at its apex, Mr. H. strapped it spirally, and the tumour gradually diminished to its present size—that of a filbert. There was apparently very little communication now with the spinal canal.

Cases of Calculi in Females.—The first, a woman, thirty years old, was delivered of her seventh child, when a globular mass,

of the size of an orange, was observed to occupy the vagina. Mr. H., having examined her, considered the mass to be a cystic calculus, and that the bladder had been prolapsed during labour. He accordingly replaced the bladder, after removing the placenta, and five or six weeks after the confinement, having incised the uretha upwards and outwards, and dilated forcibly with the finger, Mr. H. was able to grasp the stone with forceps, and removed a lithic acid calculus, of the size of a walnut. Two days after this operation the patient was out of bed and working, and she has since then remained well, and can retain her urine perfectly.

The second case was a young lady, thirteen years of age, who suffered first from a vaginal muco-purulent discharge during May, 1868, which continued until the November following, when she was seized with violent pain in the left side, extending to the lumbar region. Vomiting, and considerable constitutional excitement were present, and swelling was detectable over the painful part. Angular curvature of the spine, with a distinct projection at the upper part of the lumbar region, was also noticed. The constitutional symptoms were treated, and mechanical support applied to the spine. During May, 1869, the actual cautery was applied along the left side of the spinal projection. Two months later micturition became painful, and pus was observed in the urine. In August, 1870, an exploration of the bladder was for the first time allowed, and a calculus detected. It was of oblong form narrow anteriorly, and enlarging towards the fundus of the bladder. The lithotrite was twice used, with an interval of ten days, and all the *debris* removed. Nocturnal incontinence of urine continued for three or four weeks, but the patient recovered perfectly. All the spinal symptoms have disappeared, and only a slight curvature is now to be observed.

A female, fifty-six years old, presenting *numerous fatty tumours* on both arms, on the thighs, and on the back—varying in size from a pigeon's egg to a cocoanut—was next exhibited. She was the mother of twelve children; the tumours had been observed for twenty years, but were not painful. The arms, the only exposed parts, presented a curious appearance, as there was scarcely any

portion of the integument which was not involved by the adipose growths.

By Dr. Parsons.

A case of enlargement of the left arm, and of gastric fistula, both produced artificially—by the patient, was communicated by the late Prof. Keith, of Aberdeen, through Dr. Parsons. The patient was a young woman, aged twenty, who for two years was supposed to be suffering from elephantiasis of the left arm. Dr. Keith, finding that the swelling terminated abruptly a little above the middle of the upper arm, and that the skin above this point was perfectly sound, suspected that these appearances were caused by artificial constriction of the limb, and this opinion was verified by detecting the patient in the act of hiding a long list garter under the bedclothes. The patient being watched diligently, and a straight waistcoat applied, the morbid appearance gradually disappeared, leaving merely a loose state of the skin of the arm.

Some time afterward the same patient complained of cardiac palpitation, and a tape seton was inserted somewhat low down on the left side. By constant tampering, she managed to thrust an old rusty penny into one of the openings, and beneath the skin. The pressure of this foreign body excited inflammatory action and ulceration, until at length the stomach was opened into, and some of its contents escaped externally. The patient has now been living seventeen years with this gastric fistula. It is kept closed, for the nutrition of the body, by means of a gutta-percha plug, which is covered with oiled silk before it is introduced. The finger can be easily passed through the orifice, as far as either the cardiac or the pyloric orifice. In the former position it gives rise to painful sensations about the heart, while in the latter it can be borne without much uneasiness. The opening appears to correspond with nearly the centre of the anterior wall of the stomach. She suffers a good deal from gastralgia, for which she takes an ounce of solution of morphia (four grains) daily, but seems to enjoy tolerably good health. The mucous lining of the stomach appears intensely red, the fæcal evacuations are natural. Food is taken in the natural way.

By Mr. Hall.

Venesection in Urœmic Convulsions.—Two cases were narrated, illustrative of the beneficial effects of free bleeding in the convulsions attending urœmic poisoning after scarlatina. In the first case—that of a boy ten years old—leeches were first applied to the temples without affording relief. Ten ounces of blood were next abstracted by venesection, and fifteen minutes later three ounces more were removed. In an hour consciousness was restored, and the patient recovered. In a second case—that of a lady twenty-two years old—the temporal artery was opened with the best result, and a good recovery followed. In each of these instances the urine was scanty in quantity and albuminous, and general anasarca was present.

III.—Papers Read.

1. On Scarlet Fever, by Dr. Wiglesworth. The author commenced by remarking that the origin of scarlet fever has been ascertained to be a germ, and he believed that the breath of infected persons was the most general mode of propagating the disease. There were, however, different degrees of intensity of the poison; some patients succumbing to its violence within twenty-four hours, others lingering for five or six days, and others again dying from the sequelæ which often followed the disease. The throat and kidneys were favourable depôts for the reception of the poison. As regards treatment, the author stated that, till the nature of the germ was discovered, we could not find a specific. His treatment consisted in moderating the fever, and supporting the patient's strength. Chlorate of potash, he believed, did good in some instances. A high pulse in the early stage was a bad sign. Several cases were related by the author in support of his views.

2. On Gratuitous Medical Advice, by Mr. Harris. The author deprecated the system, as injurious to the profession, and as tending to pauperise the people. As this subject is now being handled by the profession in London, and as no doubt the members of the Society had read the account of a meeting recently held in the rooms of the Medical and Chirurgical Society, under the presi-

dency of Sir. Wm. Ferguson, he would not repeat the statements made and arguments used on that occasion.

3. On Cholera—its pathology, prevention, and treatment—by Dr. Parsons.

The *Pathology*, Dr. P. stated to be a paralysed condition of the sympathetic nervous system, caused by the introduction of a specific organic matter into some portion of the gastro-intestinal mucous membrane. For arresting the progress of the disease through the various members of a household, the author suggested liberal diet, a fair amount of rest, thorough and efficient ventilation, the maintenance of a high temperature (between 80° and 90° F.), the removal of all woollen fabrics, suspending throughout the rooms sheets soaked in a solution of carbolic acid, the immediate disinfection and removal of motions, vomited matters, and urine, and forbidding the use of drinking-water which has not been previously either boiled or filtered. Dr. P. also considered the internal administration of carbolic acid most effectual in arresting the propagation of the disease.

In considering the *Treatment* of Cholera, the author adopted Macnamara's classification of the stages of the disease. He advocated the astringent treatment in the *first* stage, and suggested the advisability of combining carbolic acid with the opiates. In the *second* stage, he recommended large doses of capsicum (30 grs.) as an excellent stimulant to the sympathetic, through the mucous, capillaries; he also advised drinks acidulated with sulphuric acid in order to neutralise the alkaline character of the rice-water fluid, and occasional doses of carbolic acid,—also friction, or chloroform, to relieve the cramps. Turpentine stupes, and sinapisms, he said, did no good, as they could not reach or affect the seat of the disease. He considered that stimulants did no good, and often did harm in this stage, while opiates were worthless. In the *third* and *fourth* stages, Dr. P. urges the capsicum treatment, and when the medicine cannot be taken by the mouth, it should be given by the rectum. In the stage of collapse, advantage is likely to be derived from immersion in a saline bath, or from enveloping the patient in sheets soaked in solutions of nitrate or chlorate of potash as likely to cause absorption through the cutaneous capillaries, and to supply

the loss sustained by the deoxygenation and dehydration of the vessels. The treatment of the *fifth* stage, or that of reaction, should be very guarded. Stimulants should not be urged for at least four or five days, bland nutritious diet should be selected; and if suppression of urine should occur, the author advised cupping over the loins, together with small and repeated doses of tinct. lyttae—10 drops every hour. The various sequelæ must be treated on general principles.

Dr. Parsons urged the use of Aitken's self-registering thermometer in all stages of cholera, as the best aid in diagnosing the various phases of the disease, and as the surest guide to prognosis. In the first stage the temperature remains normal, about 98° in the axilla, and from 97° to 98° on the tongue; in the second stage, the temperature of the axilla falls to from 95° to 97°, tongue 87° to 89°; in the third stage, the axillary temperature falls to 93° to 95°, sometimes even to 90°, while the tongue falls to from 85° to 87°, sometimes even to 82°. *In all cases that he had examined, there was a difference of* 8° *between the temperature of the tongue and that of the axilla.* He had seen only one case recover in which the axillary temperature was as low as 93°, and that of the tongue 85°; and he had never seen a fatal case in which the temperature of the axilla was 96° or upwards. In the fourth stage there is a *sudden* rise of temperature to 98°, when death speedily follows. In the fifth stage there is a *gradual* rise to the normal standard.

4. On Abortion, by Dr. O'Connor. The date, said the author, is limited by some to the first five months of uterogestation; by others to the viable period of the fœtus; while Murphy restricts it to within the fourth month of uterogestation, applying the term "miscarriage" to misses occurring between this and the viable period, and "premature labour" to the too early expulsion of the viable child. This last definition was adopted by the author, who ascribed the liability to abort at this period to the slight connexions then existing between the uterus and its contents. Moreover, the nutrient and receptive processes occurring in the uterus, and the formative in the ovum, involve organic and functional *change* during the earlier months, as contrasted with simple *increase* during the later; and, thus producing more immediate and remote derange-

ments, afford conditions favourable to separation and expulsion. The liability to abort appears to obey some law of periodicity connected with the menstrual function, so that the uterine hyperœmia at the menstrual periods being transmitted to the ovum may be supposed to tend to the rupture of the delicate connecting medium. The author has, moreover, observed the final cessation of the menses, preceded almost immediately by one or sometimes two abortions; and in other instances, where menstruation has been normally very copious or frequent, the critical period (which generally occurs early) has been ushered in by a few menstruations preceded and accompanied by some peculiar sensations resembling those which existed before and during the first change.

The predisposing causes treated of were, procidentia uteri, leucorrhea, zymotic diseases, diseases of the chorion and amnion (especially inflammatory thickening of these membranes), intramural uterine tumours, and syphilis.

In the next place, can abortion be prevented? Active interference is dangerous when there is hœmorrhage, contractile pain and bearing down efforts, nay more, the discharge of liquor amnii simulated in the earlier as it very frequently is in the advanced months by abundant secretion from the glandulæ nabothi, or even a patulous os, without suspension of gestation; but two conditions always end in abortion, viz., cessation of gestation from any cause, and death of the ovum from any cause. The direct result of the first is regular and general contraction of the uterus; in contradistinction to irregular, partial, and sympathetic contraction. The death of the fœtus, Dr. O'Connor believes to be indicated best by "transient feverish attacks alternating with syncope during the day, and irregular and disturbed sleep at night."

Regarding remedial measures in abortion, the author enumerated opium combined with some mineral acid when the state of the ovum is doubtful, but "if the uterus is inert while a portion of the ovum is separated, thereby continuing the hæmorrhage, nothing can supply the place of ergot." If the hæmorrhage is considerable and protracted, the author recommends plugging with fine sponge soaked in vinegar and water; and, in these instances,

the exhibition of ergot is mischievous, but opium, in moderate doses, should be given repeatedly. Remove the plug in twelve hours, but if the ovum is not easily brought away, now replace the plug and give a dose of ergot. Should these means fail, and the fingers be not sufficient to remove the uterine contents (though this is rarely the case), the author recommends the long flat-bladed forceps and the finger for extracting the ovum; but he considers the wire crotchet and other instruments are more liable to tear through than to extract.

Vol. V. [Price 3s. 6d.
To Non-Subscribers, 5s.

THE

LIVERPOOL

MEDICAL & SURGICAL REPORTS.

OCTOBER, MDCCCLXXI.

EDITED BY

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AND

REGINALD HARRISON, F.R.C.S.,

ASSISTANT SURGEON TO THE ROYAL INFIRMARY.

LONDON:
JOHN CHURCHILL AND SONS, NEW BURLINGTON STREET.
LIVERPOOL:
ADAM HOLDEN, 48, CHURCH STREET.
1871.

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